THE ARCHITECT & BUILDING NEWS

19 AUGUST 1959 VOL. 216 NO. 2 ONE SHILLING WEEKLY

- HYPERBOLIC PARABOLOID ROOFS
- CHURCHILL COLLEGE—II
- INFORMATION DIGEST

PUBLISHED IN LONDON SINCE 1854

FOR BACKING COATS FOR COLOURED RENDERINGS

USE **AQUACRETE**

Water-repellent cement

This ensures even and controlled suction and reduces variation in colour in the finishing coat.

Aquacrete is Portland Cement with which Medusa waterproofing compound is intimately mixed during manufacture.

It saves time mixing cement and waterproofing compound on the site and there is the assurance that the correct proportion of Medusa has been added and uniformly distributed throughout the cement.

AQUACRETE SHOULD BE USED FOR ALL RENDERINGS WHICH ARE TO BE WATER-REPELLENT.

A BLUE CIRCLE PRODUCT

Aquacrete is one of the Blue Circle aids for better building

Write for further particulars to:

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G. & T. Earle LIMITED, Hull.

THE SOUTH WALES PORTLAND CEMENT & LIME CO. LTD., Penarth, Glam.

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Nothing stands up to the traffic of millions of feet so well as LINOLEUM. Architects seeking the ideal floor covering should consider the unique combination of qualities that LINOLEUM provides.

LINOLEUM — proved for nearly a century in every type of building and in every form of transport, in almost every country in the world — is economical, hard-wearing, maintenance-free over many years, sympathetic to the feet and offers unlimited scope for design and colour.
Talk about LINOLEUM to your Flooring Contractor—he knows! Above all, talk about BARRY'S LINOLEUM, Trade Mark RUBOLEUM, the aristocrat of all floor coverings. RUBOLEUM is obtainable in 2 gauges—6.7 m.m. and 4.5 m.m. and in a great variety of colours and patterns.

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✱ Have you seen a copy of BARRY'S latest sample book? It is a revolution in Colour Harmony using, for the first time ever, colours specially blended to harmonise with B.S. Colour Range 101 and containing charts permitting simple selection of colour combinations.

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A

To please eyes that look at precious stones . . .

Wall Panelling with PANAX

THE MELAMINE SURFACE PLASTIC

Panax, outstanding plastic panelling of today, provides the setting for the committee room and the entrance hall in the British Jewellers' Association building.

Here is an invaluable material which offers designers everywhere such opportunity for distinction. Smart to see, virtually impossible to mark, Panax is made in a colourful variety of patterns. An extremely economical material too, Panax is up to 20% cheaper than similar surfaces.

Finished with melamine, the hardest known resin, versatile Panax allows you a choice of décor—in modern or traditional idiom—that keeps its youthful look throughout a long life. Panax resists heat (up to 320° F), oils, mild acids and alkalis . . . is highly resistant to chipping, flaking and scratching . . . and wipes clean and fresh as new with a damp cloth.

Photographs by courtesy of the British Jewellers' Association Carey Lane, London, E.C.2.

THE MELAMINE SURFACE PLASTIC

For full information about this colourful material with a special aptitude for modern design write to NORTH BRITISH PLASTICS LIMITED Blaydon, Co. Durham

Granwood Floors for Under-Floor Heating

Granwood Composition block flooring is eminently suitable for use over all forms of under-floor heating and has been laid in this connection for well over thirty years with entire satisfaction. It has also been used extensively in conjunction with the now popular embedded electrical systems. As Granwood is laid direct in a cement and sand screed and becomes monolithic with the floor slab the problem of softening and deterioration of the adhesive due to heat does not arise.

A few TECHNICAL details of GRANWOOD FLOORING—the ideal floor covering medium:
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Please write for illustrated leaflet. *Granwood Flooring Co. Ltd is a member of the British Steel Constructions Group of Companies.*

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Door check and closer available for both doors. 'ARMOURPLATE' and 'ARMOURCAST' are registered trade marks of Pilkington Brothers Limited. Supplies are available through the usual trade channels.

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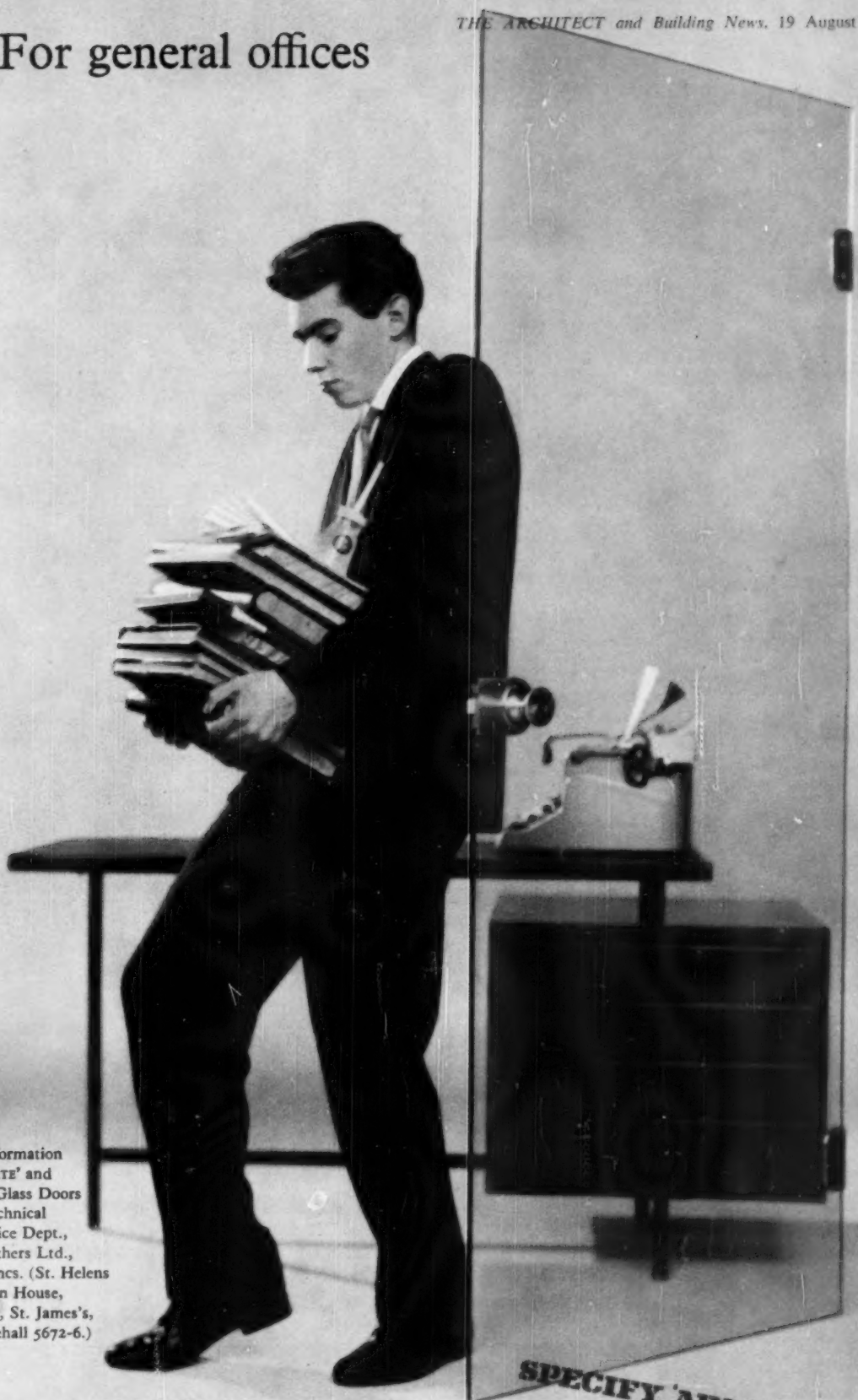
"ARMOURCAST" Glass Doors for interiors

For general offices



For further information on 'ARMOURPLATE' and 'ARMOURCAST' Glass Doors consult the Technical Sales and Service Dept., Pilkington Brothers Ltd., St. Helens, Lancs. (St. Helens 4001) or Selwyn House, Cleveland Row, St. James's, S.W.1. (WHItehall 5672-6.)

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"ARMOURPLATE" Glass Doors for interiors

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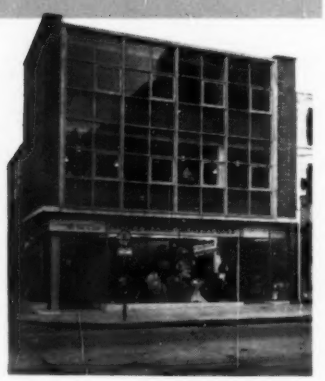

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Contractors:
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Imagination becomes fertile only when it finds the ideal outlet. Yet the right means of expression may itself be a powerful stimulus. For the architect and designer, the WARERITE idiom both expresses and stimulates. It offers a wealth of material to match the mood of his creative effort.

Rich harmonies or the occasional condiments of discord, broad patterns to impose exciting rhythms on space, or neat patterns of colour to create tactile impressions all these the designer can draw upon. Subdued or positive, cool or exotic, WARERITE laminated plastics have that intangible but unmistakable quality of Design Leadership.

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"Murilite" Pre-mixed Perlite Plaster is a combination of the well-known "Murite" Gypsum Plaster with Expanded Perlite, an aggregate of extreme lightness. This aggregate is incorporated in the factory, thus ensuring that proportions and mixing are always correct. The use of Perlite as the aggregate provides many advantages, such as extreme lightness, remarkable workability and improved thermal insulation and fire resisting properties.

Gypsum Plaster is one of the finest fire resisting materials known to the Building Industry, but when Perlite is incorporated as in "Murilite" Pre-mixed Perlite Plaster, its fire resistance is greatly increased. This outstanding quality of fire resistance is amply borne out by the high fire ratings awarded by the Fire Research Station, as a result of tests carried out on various types of structure.

Write to the address shown below for complete details of these fire rating tests made in accordance with British Standard Definitions No. 476:1953.

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. . . and your power and light switches and your dangerous wires. But how—when a factory is filled with smoke and heat that can kill a man in one breath . . . ? Ask any Fire Chief. He will tell you: the rapid removal of smoke and heat is the key to fire fighting. It enables him to get at and put out the fire before it can spread—and with the least smoke and water damage. Colt Dual Purpose Fire Ventilators not only provide an automatic means of removing smoke and flames, but also give excellent day-to-day working conditions. Hence their widespread adoption by industry. For the full story of combined ventilation and fire protection write for the pamphlet "Some Aspects of Fire Prevention" by M. J. Reaney, to Dept: AW25/6

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Combined automatic fire protection — with day-to-day controlled ventilation

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...UCTING THE ...LE SHAFT

...shaft of the pile is built up by placing ...ssive charges of the semi-dry concrete ...nto the tube and ramming each charge ...e tube is gradually withdrawn by means ...the cables attached to the lugs at its ...d. This dual action forces the concrete ...wnwards and outwards, consolidating it ... a dense shaft which compresses the ...ounding subsoil as it is forced from the ...tom of ...e tube.

...he sha... is thus greater in diameter than ...e outside of the tube, providing adequate ...er for the steel reinforcement and at ...ame time ensuring the maximum skin ... between its rough corrugated sur... the subsoil which has already been ...ed by the driving process and is ...pressed again by the greater girth ... itself.

...rmation of the pile shaft a ...mer cable serves (in the ...e tube was driven) to ...oncrete necessary to ...ater or any other ...water accidentally ...ammer jams in the ...has to be re-driven. ...l assurance that a ...ement ratio is always ...t this ratio is lower ...em of in-situ piling.

...NG THE PILE

...f the shaft can be stopped at ...el, always ...e adequate ... Except in ... piles can ... level from ...h they are installed.

It is normal practice to finish off the ...-pile about a foot above the required ... rather greater ... of the required depth b... ...rary gravel plug at the bo... ...ng — a process which at this stage ... of the operation offers an essentially two-fold advantage. (a) It seals the tube against water on the way down; and (b) the long hammer drop ensures blows of greater intensity (although they cause less vibration) than would be practicable if the hammer were applied to the head of the casing. Obstructions in the subsoil are thus more readily overcome.

Secondly, the bearing capacity of a Frankipile is not calculated from a set predetermined by empirical formulae.

It is assessed from conditions actually encountered when driving the pile and in forming its bulbous base. In this way, when ... comes to form the pile cap, the top ... of concrete

LATE NEWS

REDEVELOPMENT OF THE GORBALS

Piling is now being completed for four 17 storey blocks of flats for the Corporation of the City of Glasgow. The piles were installed to depths averaging 55 ft. below ground level and are designed to carry a working load of 45 tons each. More than 1,000 piles are required to support these 4 multi-storey blocks, and the piling has been entrusted to Messrs. Frankipile Limited, of 39 Victoria Street, London, S.W.1, who offer free literature and advice on piling problems to those Architects and Engineers who wish to avail themselves of this service.

THE FRANKIPILE

All piles constructed by the Frankipile Compressed Pile Co. Ltd., are guaranteed to carry the working load specified. The guarantee given by the company is supported by Lloyd's.

Piles are normally tested to a load of 5(per cent greater than the designated workin load, and one of several methods may b employed to test them.

These methods are the dead load test, i which the weight is provided by successiv increments of kentledge bearing directly c the pile cap, and two types of jack test. the first of these types the weight of a fi test load of kentledge is gradually trar ferred on to the pile by means of the jac in the second, the jack operates not agai kentledge but against the uplift obtair from adjacent piles.

These methods can be relied upon to g equally accurate results, the choice betw them generally depending on site conditi and the type of kentledge available.

Whichever method is used, readings taken at agreed stages during the proce incremental loading until the pile is ca ing the full test load. The full load is allowed to remain on the pile for a d mined period, which is normally 24 h

After the recording of any settle which may have occurred during this p the load is gradually reduced again, ings being taken at each stage in the way as when the load on the pile was increased.

When the pile is completely free of final reading is taken. The difference be this and the reading under the full te is recorded as the permanent settlem

Piles are normally tested singly b also be tested in groups.

The efficiency of the piling proc scribed is best illustrated by summ ...advantages in the following resp

ARCHITECTS:
Robert Matthew
and Johnson-Marshall.

CONSULTING ENGINEERS:
F. A. Macdonald and Partners.

FRANKIPILE

At Your Service throughout the World

JW 5

PLEASE HELP SPASTICS

The unjust punishment of Higgins minor...

Caned he was, and undeservedly! Of course he *had* been whispering a moment or two before but not at the precise moment when "old baldy" thought he caught him. The ghastly truth came out some days later when Smith major nearly went the same way. It turned out to be the old heating system, making enough noise to keep the whole class awake.
Nowadays of course, modern schools have Tempaflex—quiet, efficient and unobtrusive Tempaflex. Total installations to date exceed 900. If you would like to do a little swotting, why not send for our technical literature?

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Quiet heating for Schools

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268-270, Vauxhall Bridge Road, London, S.W.1. Telephone: Victoria 2006/7/8
And at Birmingham, Glasgow, Manchester, Leeds, Newcastle, Bristol, Belfast, Dublin

you have never seen

The trend in lighting today is towards high illumination. High illumination is an excellent thing in itself, but until now it has inevitably been accompanied by excessive glare with consequent discomfort to the eyes. This discomfort glare, caused not only by the light source itself, but also by the fittings, results in the increased light becoming instead of an aid to efficiency, the very reverse, an actual distraction.

Look at the picture. The office is more than adequately lighted, yet the light fittings themselves are not emitting any appreciable glare. The light source is, in fact, *unobtrusive*.

This is G.E.C. comfort in lighting—a new technique in which the G.E.C. has gone a long way towards removing discomfort glare by using high illumination in conjunction with low brightness fittings of high luminous output. sometimes called "dark" fittings because by correct design and use of suitable materials, they actually appear to be dark.

comfort in

high level illumination without discomfort glare

lighting like this before ...

You have never seen lighting like this before and no advertisement can hope to make clear to you its remarkable superiority over conventional methods. It takes 40 pages of a new G.E.C. publication No. F4695, to do this, and a copy will be sent to you on request.

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Our Ref: AOJ/CA.

18th April, 1959.

A. Crawford Esq.,
Messrs. Sundeala Board
Company Ltd.,
Sunbury-on-Thames,
MIDDLESEX.

Dear Mr. Crawford,

Many thanks for your letter of 17th inst., We shall be very pleased to do all possible that you may secure good photographs of the ceiling and hall. We suggest you leave this until we have the other work completed and the hall ready for the season when we think more successful photographs can be obtained. We could advise you when ready.

In passing, we must say how pleased we are with the ceiling and your extremely efficient and cheerfully hardworking staff who completed the work so rapidly.

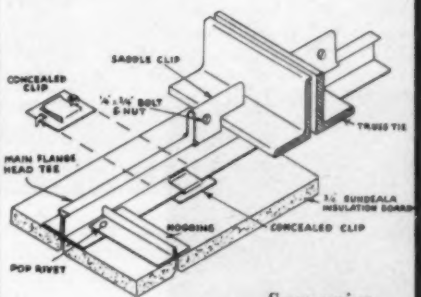
during the [illegible] you will also be successful in [illegible] this work.

Yours faithfully,

p.p. ARTHUR JONES & CO. LTD.

Thanks to *Sundeala*

The Sundeala suspended ceiling which has pleased the Arthur Jones Company is one of our concealed systems, shown below....



Suspension from Truss tie is shown here

Visible or concealed Sundeala systems give excellent thermal and sound insulation values. Available with insulation board (or ANY known rigid sheet material) to give a Class I resistance to Spread of Flame.

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SUPPLIED AND FIXED ANYWHERE IN THE UNITED KINGDOM

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Sundeala also manufacture
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Q·V·F

Photograph by courtesy of Nottingham Technical College.

GLASS SINK TRAPS AND *WASTE LINES*

QUICKFIT *Visible Flow*

Quickly fitted, Visible flow, Free from corrosion.

The Q·V·F· System of Glass Sink Traps and Waste-Lines is ideally suited for installations in Chemical, Pharmaceutical and Biological Laboratories. The transparency of the system allows any build-up of solids to be instantly detected — an important point where the efficient disposal of noxious liquids is of paramount importance. In addition, the smooth surface of the glass minimises scale formation and the whole system is sufficiently strong to withstand thermal shock of alternate flushing with boiling and ice-cold liquids.

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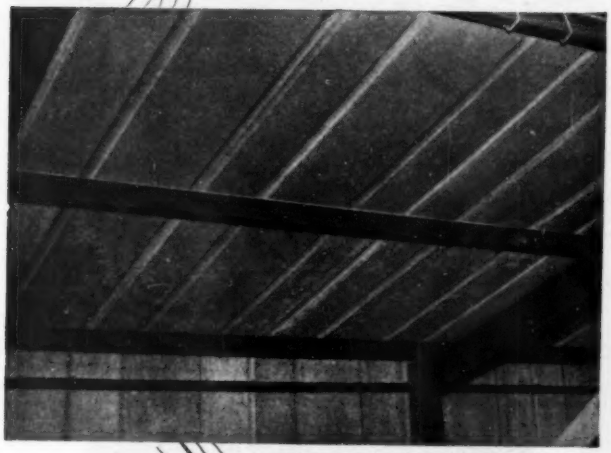
High resistance to thermal transmission...

Major Six

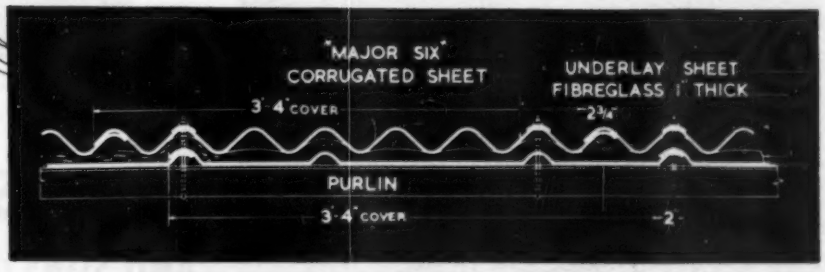
DOUBLE CLADDING INSULATION



Photograph above illustrates interior view of roof

"Major six" DOUBLE cladding insulation provides a high resistance to thermal transmission, contributing to higher equable interior temperature and consequent economical heating. Here is dependable roofing made for quick erection and permanent service.

It's the DOUBLE cladding that does it!—a rigid asbestos-cement underlining sheet laid directly to purlins as a soffit upon which the sheet of insulation is laid before putting the "Major six" sheet in position.



Easily fixed with hook bolt and washers. "Major six" Double Cladding Insulation complies with the requirements of "Thermal Insulation Industrial Buildings" Act.

THE Atlas Asbestos CEMENT COMPANY LIMITED

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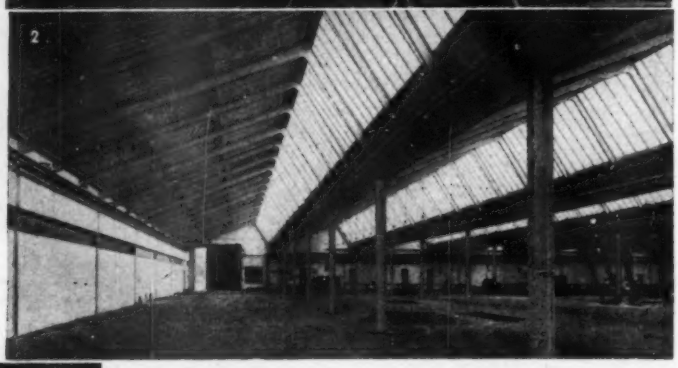
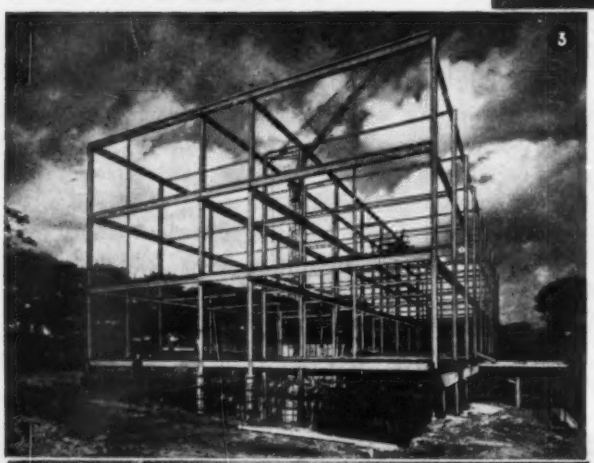
Telephone: ABBey 3081. *Telegrams: "Atlastonco, Sowest"*

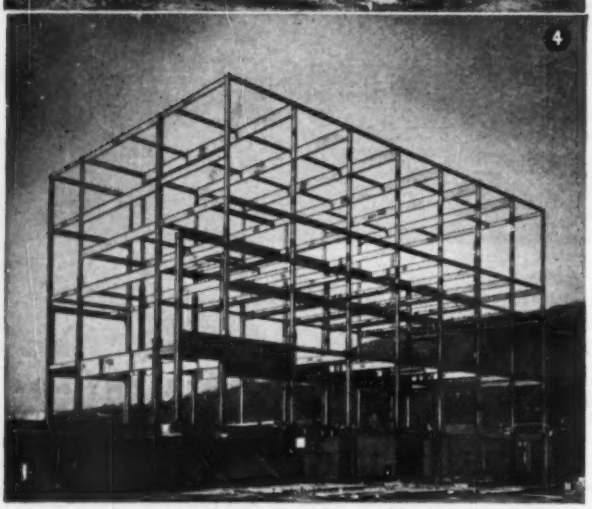
Works at: MELDRETH, Nr. Royston, Herts. *Also at:* GREENHITHE · STROOD · CAMBRIDGE · SHORNE · RYE (Sussex) · GT. YARMOUTH

1. Footbridge for Level Crossing in Grimsby.
2. Interior view of factory for Messrs. Brook Motors Ltd., Barnsley.
3. Sowerby Bridge Secondary School.
4. Control Room, Services and Welfare Block, Elland Power Station.



STRUCTURAL STEELWORK





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H.P.5917

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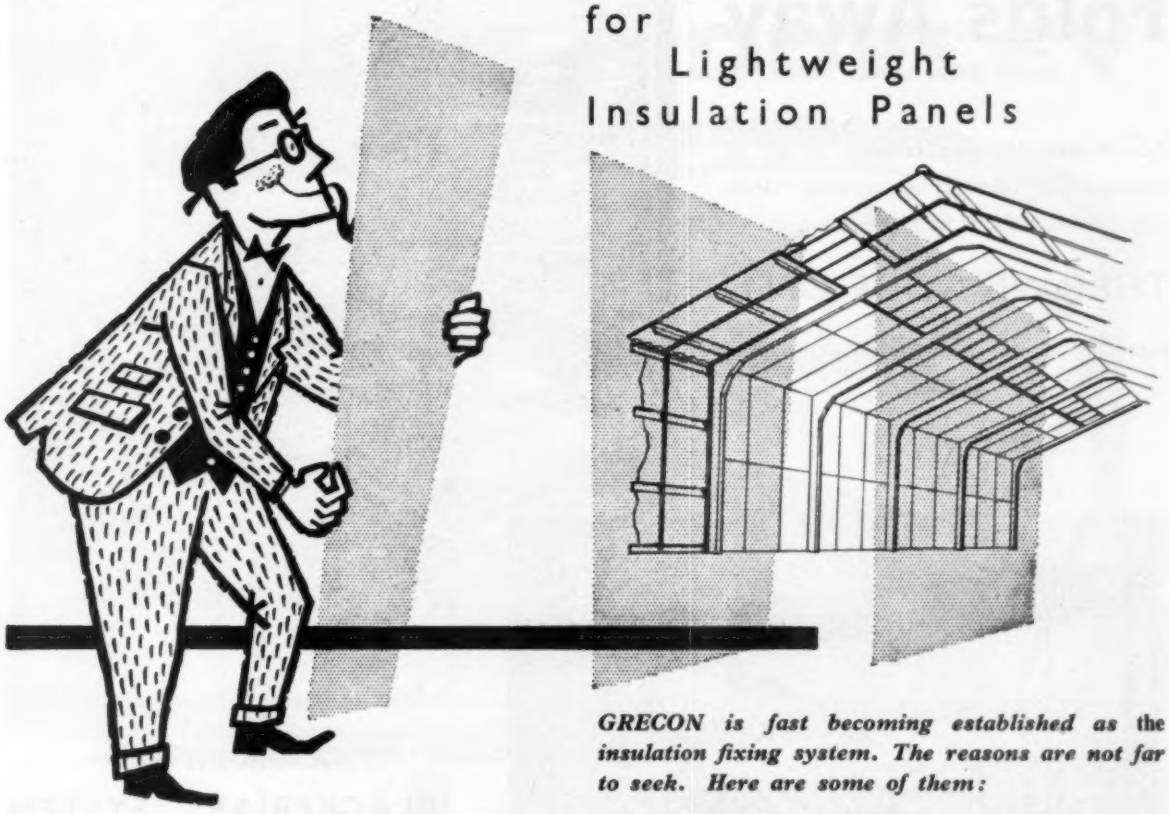
the Revolutionary Lightweight Metal Fixing System for Lightweight Insulation Panels



GRECON is fast becoming established as the insulation fixing system. The reasons are not far to seek. Here are some of them:

IT'S DOWN-TO-EARTH

It can be fitted to *any* type of building in *any* plane—without special help, without special tools, without special equipment, and is readily adapted to cope with structural peculiarities.

ITS PRICE IS RIGHT

(as far as any price can be said to be right!) It's the *first, low-cost* system on the market. What's more, it reduces panel waste to a minimum.

IT'S DOWNRIGHT SENSIBLE

You can remove the panels, and re-fit them *without damage* to anything. . . . It keeps the warmth IN the building and harmful vapours OUT of the roof air-space.

PRICE —One GRECON Pack, containing all the fittings to cover a 50 sq yd area, costs only £10. (Plastic sealing strip and panelling extra.)

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Metal Fixing System
is endorsed by
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manufacturers of
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Use only non-flam, non-corrosive or Standard Grades of expanded Polystyrene.

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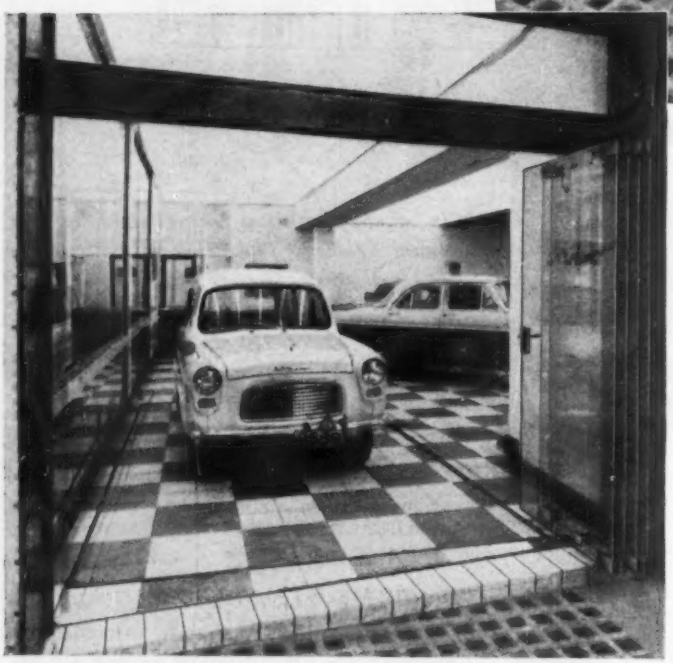
Glass Folds Away

An all-glass frontage, creating an air of spaciousness, offering unobstructed views, and providing liberal natural lighting, can be

THROWN WIDE OPEN

extending a welcoming invitation to the public.



Motor-car showroom entrance for H. & J. Quick Ltd., Deansgate, Manchester.
Designed and constructed by Harris & Sheldon Ltd.

Folding doors are only one application of the

CLARK-EATON 'BLACKFRIARS' SYSTEM OF ALL-GLASS CONSTRUCTION

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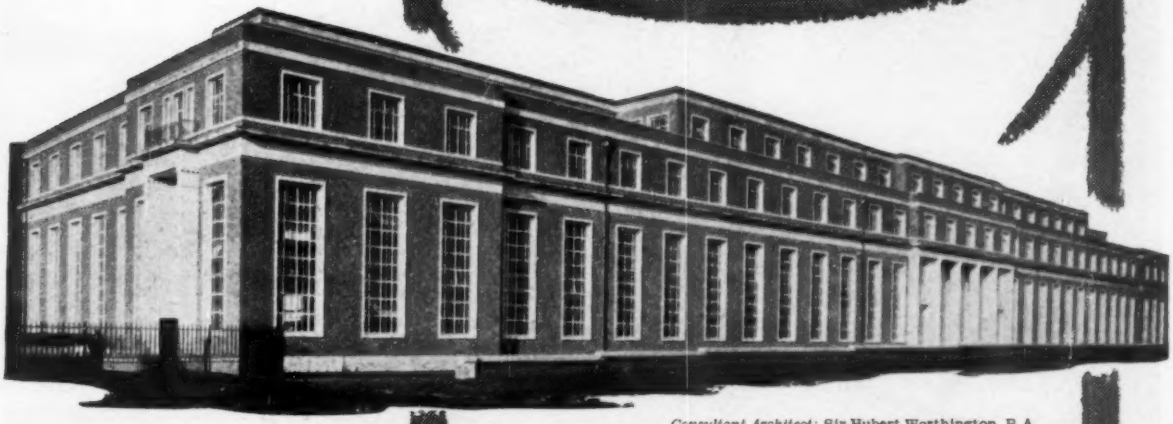
In the

HAWKER-SIDDELEY

building . . .



Consultant Architect: Sir Hubert Worthington, R.A.
Executive Architects & Consulting Engineers: Norman and Dawbarn

. . . the

finishing

touch

Fine buildings deserve fine finishes; therefore the Hawker-Siddeley Group chose Cerrux finishes for both the interior and the exterior paintwork of their new administrative building at Kingston-upon-Thames.

is . . . **CERRUX**

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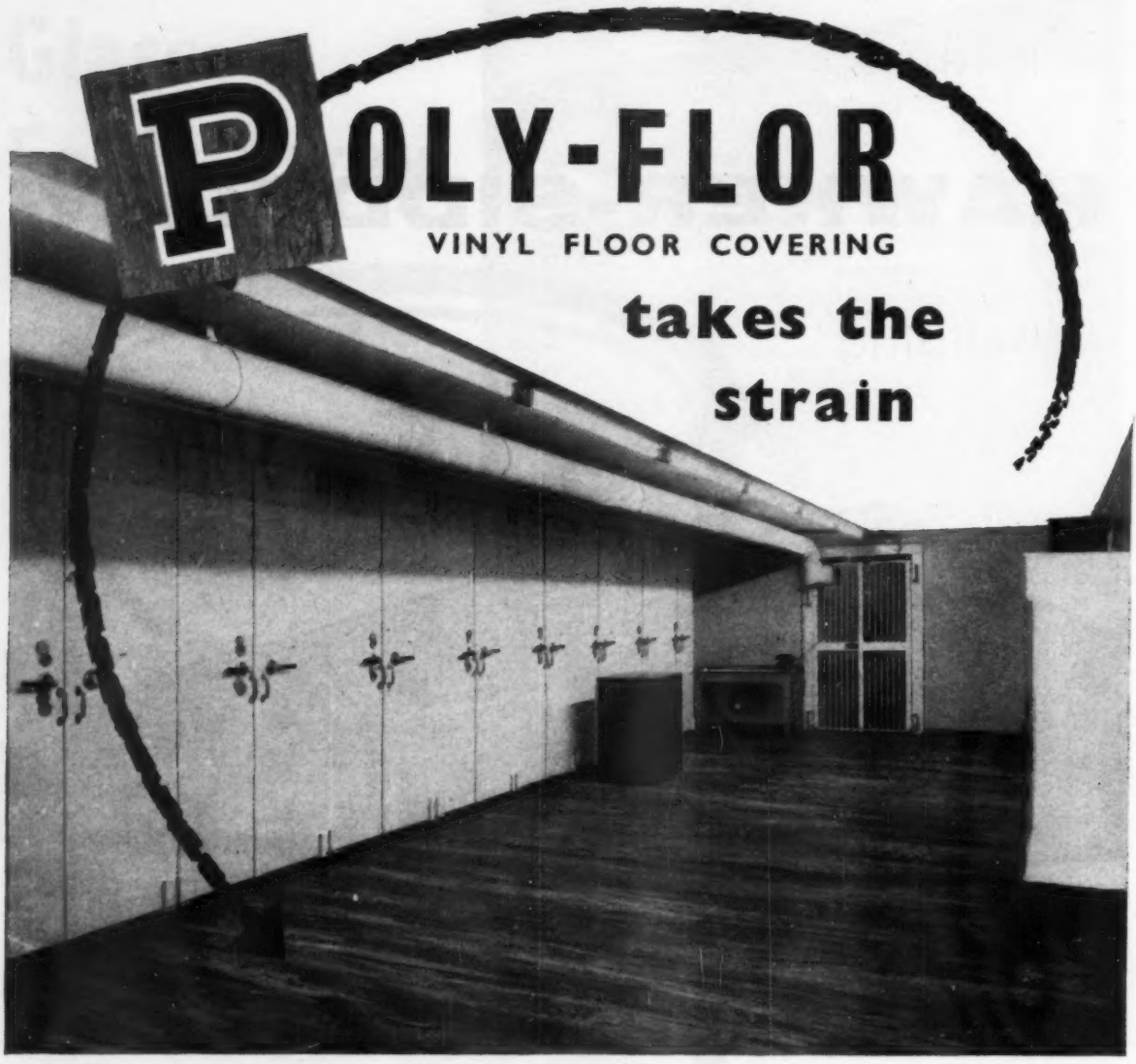
CVS-921



When the architects, Messrs. Furrow, Stocks and Furrow were planning the vaults and silver rooms at the S.A. Reserve Bank, East London, they were presented with a problem. The floor would be subjected to bullion wagons, running on steel wheels, carrying 2,000lb which would be left standing overnight. To overcome this problem they chose Poly-Flor 90 gauge as the material most suitable to fulfil their requirements. Their faith has been well rewarded, for after 2½ years there is still no sign of damage or indentation. If you have a similar problem, specify Poly-Flor—you can rely on it!

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'College'

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For End or Centre folding partitions from 6ft to 16ft high and for any width of opening. Specify 'Council' for Top Hung doors and 'College' Bottom Rollers when weight must be taken on floor. *List FP/ICB.*

'Tangent'

GARAGE DOOR GEAR

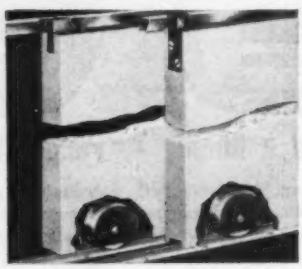
Famous 'Tangent' Gear (400,000 Sets sold) for doors hung in sections to slide round the corner, to lie flush along the inside wall when open—entirely clear. Nothing to slam with wind. The section under curve swings and forms the service door. Standard Sets cost from 228s. 'Tangent' can be tailored for *any* width of opening, and is the best to use for wide 2/3 car garages. *List T/ICB.*

'Ultra'

OVERHEAD GARAGE DOOR GEAR

As a very busy executive let me tell you what a satisfied user I am. Out for my car in a cold, wet morning I want no sticking door—just a brisk getaway. Four Standard Sets: 'Ultra' 140 — 'Ultra' 150 — 'Ultra' 210 —'Ultramatic' 180 (self opening) from £10 18s. 9d. per set. Door illustrated, 7ft wide × 7ft or 6ft 6in high, complete with 'Ultra' Set 150, costs only £18 17s. 6d. Door 8ft wide, add 30s. This one-piece door is the most economical closure for any private garage or for a range of lock-ups. Fit with confidence. *List OD/ICB.*

1. Alloy top guide channels.
2. Nylon wheels.
3. Bottom rails in alloy or brass.
4. Alternative machined toughened composition guides.
5. Cadmium-plated one-piece steel body.
6. Silver-steel axle for precision.



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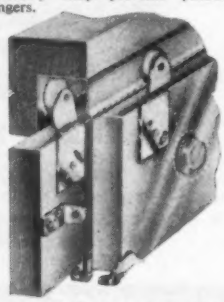
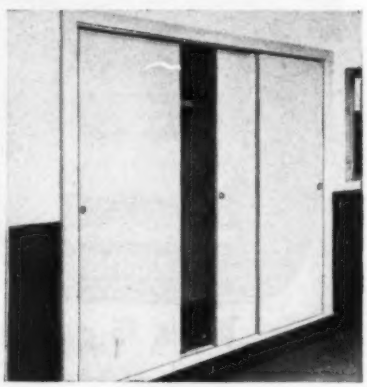
2. Noiseless nylon wheel silver-steel axle.
3. Adjustable apron simple fixing—no mortising—invisible from outside.
4. Doors lift on or off jump-proof track—without removing hangers from doors.
5. Flush pulls outside—brass B.M.A.
6. Patented adjustable nylon guide—no grooving—simply screw to floor.
7. Safety Stop—prevents pinched fingers.





'Double Top'

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Vol. 216 No. 2

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19 August 1959

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HOLIDAY HOMES

A COMPLETE rethink of the whole problem of holiday accommodation is long overdue. Since the war there has been a very large increase in the number of families who spend their holidays away from home and the signs are that this increase will continue.

Apart from special accommodation, such as the Butlin camps, most of these extra families have gone into caravans. There has been little or no increase in hotel accommodation and so far we have had few motels of the American type.

The growth of caravan parks has coincided with the imposition of general planning control over the countryside and as a result we have been spared the worst horrors of country slumdom. Most of the caravan parks are well conducted and orderly and a real attempt has even been made in some cases to fit them into the pattern of the countryside.

There is no doubt that caravan parks meet a real need in a thoroughly practical and relatively inexpensive way. It seems that we must accept them as a permanent part of the holiday landscape but in doing so it is only proper to ask if the present type of park is not based on a fundamental misconception.

This point was raised recently by Mr. Rose, the County Planning Officer of the Isle of Wight, in a paper to the Royal Society of Health. After pointing out that the number of caravans had increased tenfold in the last ten years and that half of them were on static sites, he said that very few move more than once a year, and that in many cases they only travel once in their lifetime—from the maker's yard to the site.

He asked if it was reasonable to design static caravans as vehicles to comply with the Road Traffic Acts. If it were once accepted that caravans could be portable but not mobile, it would not be necessary to restrict them to the present maximum of 22ft by 7ft 6in. They could be moved around on special low-loaders and with the removal of the undercarriage they could be lower in overall height and less visible in the landscape.

This idea may set many architects and industrial designers reaching for a pencil to design a new type of portable "Minihome" which could be detailed for mass-production to a degree of finish and convenience as yet unknown. It could be built in sections bolted together. This would allow for easy transport and a family could expand its holiday home as its needs and income grew.

It is about time that this country produced something startling in the holiday line to match the reputed triumphs of the American motel and the French supertent. Designers and Industrialists unite!

EVENTS AND COMMENTS

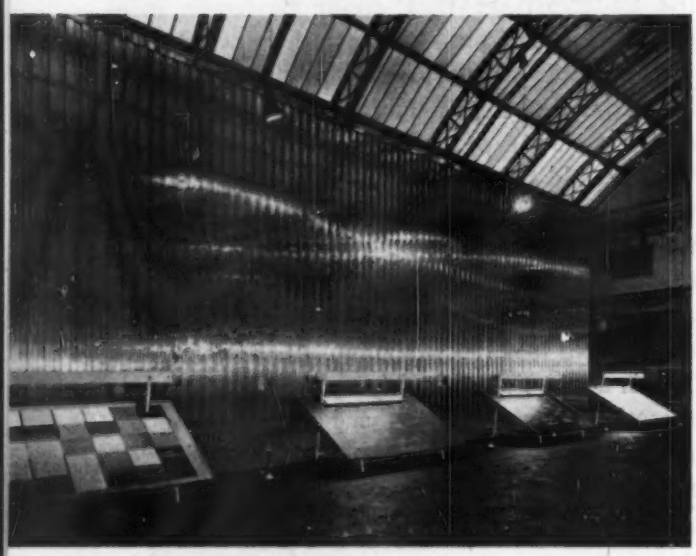
RUSSIAN ARCHITECTS' VISIT

A party of twenty-one architects—twelve men and nine women—from Moscow, Leningrad and Tilsit recently paid a private visit to this country. The party had a very full programme including visits to several new towns, the L.C.C., the Building Centre, Coventry and Edinburgh, as well as to the sights of London. They were entertained in London and Edinburgh by Professor Robert Matthew, chairman of the U.K. committee of the I.U.A. and in Edinburgh were given a civic luncheon with a piper in attendance. The P.R.I.B.A. held a morning reception for the party which was also attended by members of the I.U.A. committee. This was, I believe, the first unofficial party of Russian architects to visit this country. All who met them were impressed by the easy relaxed manner and their ability to talk about architecture instead of the familiar problems of mass production. There is no doubt that the visitors were much impressed with what they saw. They thought our schools were wonderful and praised their brightness, colour and landscaping. They found it difficult to understand why we had not replanned the City of London properly and laughed loudly when it was explained that such things were difficult in a democracy. The women thought our women were all smart and beautiful. As for our civilization—washing-up machines and under-sink grinders caught their fancy though they were a little surprised to find that nobody much seemed to have them. Those who met the party felt that they were able to do rather more for East-West relations than the Foreign Ministers then still wrangling at Geneva.

QUEEN'S HALL SITE

Many people would have liked to see another concert hall built on the site of the Queen's Hall, perhaps hoping that a new building would catch the musical magic of the old. No doubt they remembered wistfully the faded green and gold decoration and the small comfortable auditorium with its perfect acoustics. There is to be no concert hall. Instead we are to have a "complex" containing offices, shops, an hotel and possibly a students' centre for the British Council. The freeholders are the Crown Estate Commissioners and the site has been let to the highest bidders, the Laing Development Corporation. The building has been designed for the Corporation by Sir John Burnet, Tait, Wilson & Partners.

An example of Rigidal Seamwall, developed by the British Aluminium Company



WATNEY'S BREWERY, VICTORIA

Some time ago there was a rumour that the developers were after the Stag Brewery site near Victoria Station. It was said that outline planning permission for the project was being applied for without the knowledge of the brewers. Since then Mr. Clore has made his bid for Watneys and been seen off, but now comes the news that the site has been leased to a property company and that a vast scheme of offices and flats is under consideration by the Minister. The architects are Howard, Fairbairn & Partners and Trehearne & Norman, Preston & Partners. From the look of the model the site does not appear to have been considered as an entity but rather as a plot of land upon which individual and unrelated blocks have been uncomfortably juggled into an unhappy arrangement.

TRADE AND TECHNICAL LITERATURE COMPETITION, 1959

The organizers, the R.I.B.A. and the B.C., announce that because of delays caused by the recent printing dispute, the last day for receiving entries for this competition has been put back until December 31, 1959. It is most encouraging to see how many manufacturers are going over to the international paper sizes for their trade literature, and not only manufacturers either. The announcement of the results of the competition was put out by Churchill College on A4 sized paper.

LARGE-SCALE ALUMINIUM CLADDING

The British Aluminium Company has developed a new sheet to be known as Rigidal Seamwall. This sheet, which can be supplied in lengths up to 40ft, is 12in wide and has a bold angular profile. Plain or stucco embossed surface finishes are available. Seam joints are supplied ready caulked and their overlaps are locked in position by means of a neat hand button punch which dimples the sheets together. As at present designed, however, this tool needs careful handling if the profiling of the sheets is not to be damaged. The punch seemed to me to be rather too heavy for its job. The effect of this cladding material is impressive when seen on a large area, the profile being sufficiently bold not to be lost. The system has been well worked out and is illustrated and described in British Aluminium publication, No. L55 10m 6/59.

MORE EUSTON ROAD DEVELOPMENT

My picture shows a scheme designed by Stone, Toms & Partners for the St. Martin's-le-Grand Property Company, in association with the Laing Development Corporation (see paragraph on Queen's Hall site). The site is on the south side of Euston Road and the completed scheme will stretch from Gower Street to

Tottenham Court Road. Work has started on the tall block which is due to be completed in two years' time. The whole project will be built within three years. With the rebuilding of the area from Tottenham Court Road to Great Portland Street, about which I wrote some months ago, this will completely change the atmosphere of this part of London. Having lived and worked in the area for many years I am sorry to see the end of so many, for the most part curious, though dirty and apparently little used, shops, showrooms and other buildings. Whether the new Euston Road will have any character is, it seems to me, at least open to doubt. It will certainly be a splendid showplace for manufacturers of curtain walling.

TREES IN DANGER AT RICHMOND

A letter from Miss Sylvia Crowe, the landscape architect, and Sir Hugh Casson in the *Times* recently, told of a threat to nine 150-year-old and very handsome plane trees standing on Corporation Island in the Thames, just below Richmond Bridge. This brought to light a long struggle between the Richmond Society and the Richmond Borough Council. The Society alleges that the Council has neglected trees in the borough for 40 years and that this neglect has brought about the felling of over a thousand since the war. The Council says the trees on the island are dangerous and proposes to fell them. This, for the island, would be as drastic as shaving the head of a beautiful woman, and the island would take much longer to recover. The Richmond Society says that there is no need to fell the trees which could be rendered safe if the camp-sledging (fascinating technical word for sloped paving) and general structure of the island were repaired and maintained in accordance with the covenants entered into when the Council bought the island. These repairs, with careful tree surgery to the crowns of the planes, could, says the Society, preserve the very splendid 70ft trees for many years. No one denies that it would be cheaper to fell the trees than to repair the island and that seems to be the attraction for the Council. If young trees are to be planted in place of the planes the island will surely have to be repaired anyway? This is something of a test case since there are two other islands in the borough both neglected and both with fine trees. The Society sees an implied threat to them as well. Unfortunately the eminent experts consulted by the opposing sides in this row have given quite contrary opinions. They should be brought together to save the trees. If you live anywhere near Richmond go this week-end and look at the trees. Imagine the island without them and then drop your protest in the Town Hall letter box—it is conveniently close.

EXHIBITION OF SWISS ARCHITECTURE

London is to have a Swiss fortnight in October. Architecture will be covered by an exhibition at the R.I.B.A., illustrating Swiss industrial buildings.

EDINBURGH FESTIVAL EXHIBITION

This year's special exhibition is to be "Masterpieces of Czech Art" from the National Gallery, Prague. In addition there will be supporting exhibitions of modern Danish sculpture, modern Italian architecture and the work of members of the Royal Scottish Academy.

The exhibition will be opened by H.E. the Czechoslovak Ambassador, on Friday, August 21, and will remain open until Sunday, September 20.

A large scheme of offices to be built in Euston Road, designed by Stone, Toms and Partners

BUILDING MATTERS

The B.B.C. Press reception at which "Building Matters"—see this page last week—was announced was very well attended. If good wishes count for anything this programme will be an enormous success. Sir Hugh Casson, a vice-president, passed on the blessings of the R.I.B.A., Mr. David Woodbine Parish, vice-president of the N.F.B.T.E., spoke for all builders, and Mr. W. James, council member of the R.I.C.S., welcomed the programme on behalf of the Institute. Trade associations and manufacturers are naturally delighted. It seems to me that the organizers are going to find it difficult to obey the B.B.C.'s "no advertising" rule. Mr. J. D. F. Green, controller of talks, who introduced the programme, said that he hoped that "Building Matters" would do for the smaller builder what Mr. Middleton did for gardening. The programme is to consist of two nine-minute features—talks, interviews and discussions—which will be billed in advance, and a news bulletin. The remaining time will be used for topical items which will not be decided upon until the afternoon of the broadcast. The second programme on October 6 will include the first talk in a series to be called "Know your Industry" which will include contributions on sources of information, British Standards, Codes of Practice, Trade Associations and so on. At first sight it may seem as if the well-informed will find little new in the "set" part of the programme but, since the speakers will all be experts, what they have to say should be completely up to date. For those who are well read the news and the other topical items may provide the main interest. Controversial subjects will, I understand, be debated from time to time. The programme will run for 12 weeks, its continuance thereafter will depend on its success, but it is hoped that it will become a permanent B.B.C. feature.

CORRECTIONS

In my note on "Building Matters" last week, Bill Bryant, Public Relations Officer of the N.F.B.T.E., became Professor Bryant after the copy left me. I am sorry if I caused anyone to think that the builders were setting up a university in New Cavendish Street.

My apologies to Mr. Crichton, who, though in every way an admirable choice, does not spell his name Creighton. My fault this time.

ABNER

NEWS

R.I.B.A. Council Elections

Basil Spence has been re-elected president of the R.I.B.A. for the session 1959-1960. The other officers are: past presidents: Kenneth Cross, Sir Howard Robertson; vice-presidents: Norman H. Fowler, A. G. Sheppard Fidler, Sir Hugh Casson and D. E. E. Gibson. Honorary secretary: Richard H. Sheppard; honorary treasurer: Hubert Bennett.

Fellow Members of Council: Hubert Bennett, Sir Hugh Maxwell Casson, Clifford E. Culpin, E. Maxwell Fry, D. E. E. Gibson, Arthur G. Ling, Eric A. Lyons, Professor Robert H. Matthew, Edward D. Mills.

Associate Members of Council: W. A. Allen, A. W. Cleeve Barr, John C. Eastwick-Field, S. A. W. Johnson-Marshall, Sergei Kadleigh, Peter F. Shepheard, John C. Stillman, H. T. Swain, Thurston M. Williams.

Licentiate Members of Council: Gwyn H. Morris, Dr. Thomas Sharp, R. W. Toms.

Ordinary Members of Council: Denis Clarke Hall, Harold Conolly, Harry Durell, Professor R. J. Gardner-Medwin, Frederick Gibberd, W. G. Howell, P. E. A. Johnson-Marshall, Richard H. Sheppard, L. Hugh Wilson.

Representatives of Allied Societies. (1) Northern Province: Professor J. H. Napper, Professor R. A. Cordingley, M. G. Gilling, Arthur Lazenby, E. O. Robinson, W. L. Clunie. (2) Midland Province: Edward Holman, T. A. Collins, J. A. Wardley, E. H. Ashburner, A. W. Eccleston. (3) Southern Province: John Radford, E. F. Tew, David Beecher, Frank R. Greenen, Stanley E. Bragg, Reginald Arthur Cooksey. (4) Scotland: J. A. Carrick, G. H. Lawrence, J. A. H. Mottram, T. H. Thoms. (5) Wales: Lewis John. (6) Ireland: H. S. Robson, G. P. Bell. (7) Overseas: Douglas E. Kertland, Kenneth Cross, Professor C. R. Knight, R. H. Uren, H. A. P. Kent, Professor Sir William Holford, H. N. Dallas, Stuart Bentley.

Architectural Association: H. T. Cadbury-Brown. Association of Building Technicians: Kenneth J. Campbell. Chairman of the Board of Architectural Education: D. H. Beaty-Pownall. Chairman of the R.I.B.A. Registration Committee: S. Vincent Goodman. Chairman of the R.I.B.A. Allied Societies' Conference: Norman H. Fowler.

The Rome Scholarship for 1959

The Faculty of Architecture of the British School at Rome awarded the Rome Scholarship for 1959 to Mr. John Alan Whewell, DIP.ARCH.

Mr. Whewell, who is 28 years of age, is a post-graduate student in the School of Town and Country Planning at Manchester University. Eight candidates were admitted to the En Loge stage of the competition and five to the final stage, one of whom subsequently withdrew. The Rome Scholarship in Architecture is provided for by an annual grant made to the British School at Rome by the R.I.B.A.

Foreign Planners Look at England

Twenty town planners from many parts of the world have been meeting in England for the first British Council course on Town and Country Planning to be held in the past nine years. The visitors are seeing the main features of post-war planning in Britain, particularly the many important building projects now taking shape.

Housing Progress

The number of permanent houses completed in Great Britain during May was 22,426, compared with 23,474 in May 1958, bringing the total for the first five months of the year to 105,750 compared with 110,498 for the same period last year.

The figures include 2,223 completions in Scotland during May: 1,300 fewer than in May, 1958. Scottish totals for the first five months are: 1959, 11,889; 1958, 14,826.

New Construction Orders

Orders for new work valued at more than £378 million were obtained by contractors in the construction industry during the first three months of 1959, according to provisional figures collected by the Ministry of Works. Figures for comparative periods are: 1958, £339 million; 1957, £368 million. The total figure for new work in the last quarter of 1958 was £329 million.

Private developers spent £101 million on housing and the total value for housing, including public authorities, was £175 million. The latter figure is £25 million more than in the last quarter of 1958 and £15 million more than in the first quarter of 1957—the previous peak quarter since the present series of figures began in 1956.

Home Heating Experiment

Tenants of a block of eight maisonnettes on St. Mathew's Estate, part of Leicester Corporation's redevelopment scheme, are taking part in an interesting heating experiment. The maisonnettes are two- and three-bedroom, in a four-storey block, and each has a gas-fired warm-air heating installation. The units are Radiation Ductair 20 coupled to a New World Circulyn, which provide thermostatically controlled warm air to the kitchen, living rooms and bedrooms, in addition to serving the hot water cylinder and a clothes drying cupboard.

It is estimated that the tenants will pay only 10s to 14s a week on the domestic two-part tariff, for central heating and hot water throughout the year. A close check is being kept on consumption and costs by the housing department in order to make comparisons over the year with similar blocks on the estate which have conventional open fire heating, and electric thermal block storage heating. At the official opening of the experiment, Alderman Miss May Goodwin, chairman of Leicester Housing Committee, said: "We are most anxious to discover whether our Corporation tenants can afford the comfort of central heating. The result of these heating trials over 12 months will determine the future policy for Corporation houses and flats."

St. Mathew's estate is part of a smokeless zone, in which 750 flats and maisonnettes will be built during the first stage of a three-year development programme. The maisonnettes have gas cookers and refrigerators installed, and are let at 37s 2d and 41s 4d per week, inclusive of rates.

Landscape Architecture

The Institute of Landscape Architects propose to set up a Landscape Design Centre for the criticism of students' work and for the promotion of good landscape design. It is intended that there will be criticism by senior members of the institute at least one evening every two weeks. A meeting of potential students and the staff will be held at the Institute of Landscape Architects, 1 Park Crescent, London, W.1, at 6.30 p.m. on the evening of September 1, in order to discuss the programme and essential arrangements. All persons wishing to study landscape design are invited to attend, and those wishing to do so are asked to inform the director.

Coming Events

Royal Institute of British Architects

August 13 to September 12. Monday to Friday, 10 a.m. to 5.30 p.m., Saturday, 10 a.m. to 1 p.m. Exhibition of Competition Designs of Churchill College.

October 6 to 17. Monday to Friday, 10 a.m. to 7 p.m., Saturday, 10 a.m. to 5 p.m. Exhibition of Industrial Architecture in Switzerland. At 66 Portland Place, W.1.

Law and Administration

Town and Country Planning

The new *1959 Act* institutes some important changes in the procedure for obtaining planning permission and for planning appeals. These changes are to be discussed in detail in the next issue. The new requirements include the submission of certain certificates by applicants and appellants; *The Town and Country Planning General Development Order, 1959*, regulates the town in which these and other certificates shall be presented. The order also lays down the procedure by which certificates of appropriate alternative development are to be applied for and issued. Provision is also made for appeals against the terms of any such certificate. These certificates form part of the new arrangements for the assessment of compensation on compulsory acquisition of land; that subject is to be discussed in detail in a separate article shortly.

In future, when development of certain kinds is to be undertaken, the submission of application for planning permission to carry it out must be advertised. The classes of development to which this provision will apply is set out in Article 7 of the Order.

Under the 1959 Act a great many new forms of notice related to compulsory purchase will be required and the new range of notice is set out in *The Town and Country Planning (Prescribed Forms of Notices) Regulations, 1959*.

For a long time there have been bitter complaints of "planning blight"; the damaging effects upon the value of property which certain types of notation in a development plan can have. Thus an owner may find it almost impossible to sell a house when it is shown on the line of a proposed highway. This hardship is particularly acute when the property is owner-occupied.

The 1959 Act goes some way to meet this complaint by providing that where certain property is below a certain annual value and is owner-occupied and affected by specified forms of planning light (as set out in Section 39) the owner shall be entitled to require the appropriate authority to purchase the property. The ceiling value below which these new provisions will operate has been fixed by the Minister of Housing at £250 by virtue of *The Town and Country Planning (Limit of Annual Value) Order, 1959*.

These three Instruments came into operation on August 16, 1959.

Local Government Allowances

The Minister of Housing and Local Government has made *The Local Government (Allowances to Members) Regulations, 1959*, which came into operation on July 29, 1959. The effect of the new Regulations is to increase the maximum rates of subsistence allowances to which members of local authorities and similar bodies are entitled under the *Local Government Act, 1948*.

New Acts of Parliament

A number of new Acts received the Royal Assent last month in addition to the *Town and Country Planning Act, 1959*. The three Acts most important to readers and which will be the subject of comment in succeeding weeks are the *New Towns Act, 1959*, the *Landlord and Tenant (Furniture and Fittings) Act*, and the *Factories Act, 1959*.

An Act of more general application which also received the Royal Assent last month was the *Pensions (Increase) Act, 1959*. This has been the subject of two Ministry of Housing and Local Government publications. *Circular 46/59* provides local authorities with guidance on the detailed application of the provisions of the Act to certain former public servants and to increases payable by local authorities. The Ministry have also issued a Short Pensioner's Guide obtainable from H.M.S.O., price 2d.

Proposed offices in Endell Street, High Holborn, which will contain an indoor swimming pool. Joint Architects: J. Seymour Harris and Partners; F. A. G. Cook, Holborn Borough Council

New convention centre, Las Vegas, which has an aluminium domed roof. Architects: Adrian Wilson and Associates

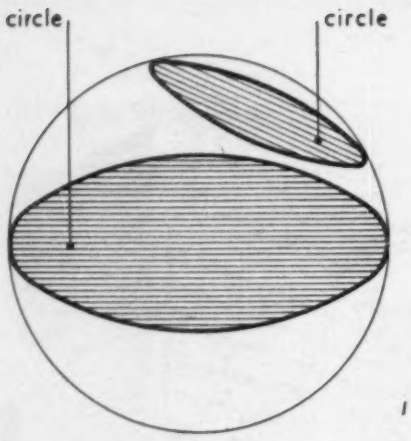
The Lady Godiva circular restaurant, recently opened in the shopping precinct, Coventry. Architect: Arthur Ling, Coventry City Architect and Planning Officer

THE ARCHITECT and Building News, 19 August 1959

HYPERBOLIC PARABOLOID TIMBER SHELL ROOFS

By L. G. BOOTH, M.H., Ph.D.

The hyperbolic paraboloid roof is undoubtedly gaining ground. Its success is due to several qualities inherent in the structure: speed of erection, a high quality self-finish, and comparative low cost. Another merit is the exciting geometry of the shell, which provides a welcome relief from post and beam architecture. On the other hand we should resist indiscriminate use—a plague of paraboloids would mar the beauty both of the roof and the countryside



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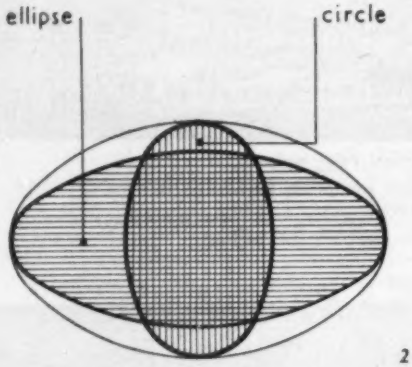

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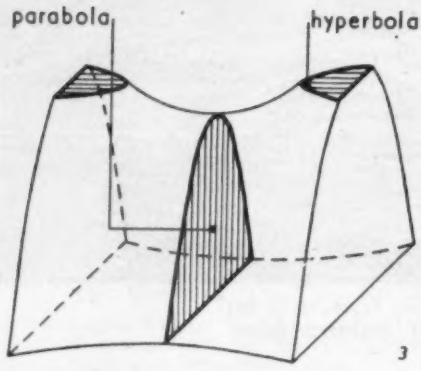

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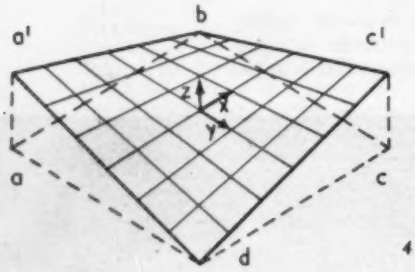

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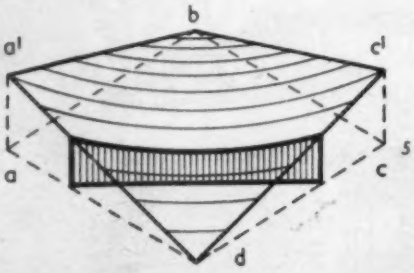

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SINCE the completion of the multiple hyperbolic paraboloid shell roof for the Royal Wilton Carpet factory (A. & B.N., 29/8/57), considerable interest has been shown in the use of this method of construction. In this issue the only other buildings of this type so far completed in this country are described. Many similar projects are, however, being constructed or are on the drawing board.

The purpose of this article is to provide a review of hyperbolic paraboloid roofs—their forms, structural behaviour, construction problems, and their advantages and limitations.

Shape of the Roof

The hyperbolic paraboloid is a three dimensional surface and belongs to the family of surfaces known to mathematicians as conicoids. Many members of this family are of everyday significance—the sphere, the rugby football "elfipsoid", the cooling tower hyperboloid of revolution, and the cone.

If we take a slice through a sphere the cross section revealed is always a circle (fig. 1), whereas a slice through the rugby football will reveal either a circle or an ellipse, depending on the direction of the slice (fig. 2). The hyperbolic paraboloid derives its name from the fact that certain sections reveal hyperbolas and others parabolas. (Fig. 3.)

A portion of the surface of the sphere is, through everyday recognition, easy to imagine, whereas the hyperbolic paraboloid surface is not part of the daily visual vocabulary. It can, however, easily be constructed. The four straight lines in Fig. 4 form the square ABCD. Lift points A and C into new positions A′ and C′. To begin with we will place A′ and C′ the same height above plane ABCD. Now divide A′D and C′B into an equal number of equal portions (say six) and then join corresponding points. Similarly with A′B and C′D. The surface defined by these straight lines is part of a hyperbolic paraboloid.

Although straight lines exist on the surface this is a truly doubly curved surface and is known to mathematicians as a ruled surface. The cone is an obvious example of a ruled surface since a series of straight lines may be drawn through the apex and lie on the surface. A not so obvious example is the cooling tower.

From Fig. 4 we see that all cross sections of the surface parallel to the edges are straight lines. Cross sections parallel to the diagonals are parabolas (Fig. 5), which are either concave upwards (raised corner diagonal) or concave downwards (low corner diagonal).

Mathematically the surface may be expressed as: $z=kxy$ where the axes are shown in Fig. 4. k is a constant and is a measure of the slope of the sides of the square. For example if k is small, the surface is shallow (when $k=0$ it degenerates into a plane), whereas when k is large the slope of the edges is steep.

The value of k is important since it determines the "rise" of the shell, which is defined as the difference in height of the low and high corners. in roof trusses the ratio of depth to span is an important design consideration, but in hyperbolic paraboloids the ratio of the "rise" to the diagonal span is the significant factor.

For simplicity in the above we lifted the points A′ and C′ in Fig. 4 equal heights above plane ABCD. All the points could be at different levels (Fig. 6) and the surface is still a hyperbolic paraboloid. An interesting special case of this is to raise (or lower) only one point (say C) (Fig. 7). With differing levels of the corners we define the "rise"' to be: $\frac{1}{4}$ (sum of heights of high corners−sum of heights of low corners). Which is a high corner and which low now needs to be defined—concave upwards parabolas run between high points and concave downwards between low points.

One final limitation—the edges must be straight lines and the plan must be square.

Structural Action of the Surface

A complete analysis of the stresses in the surface when subjected to load is extremely complicated and an engineer should be consulted in the early stages of the design.

The structural behaviour of the hyperbolic paraboloid and the way

the load can be transmitted to the ground can, however, be simply explained. The shell may be considered as a system of intersecting "arches" (Fig. 8) and "suspension cables" (Fig. 9), half the load being carried by the "arches" and half by the "suspension cables". Thus the surface is in direct compression in directions parallel to the "arches" and in direct tension in directions parallel to the "cables". Since the sections parallel to both diagonals lead to the same parabola, the force at some point P on the edge due to the "arch" is the same as the force applied by the "cable". Since they also act at equal angles to the edge, but in opposite senses (one inwards, the other outwards) there is no component perpendicular to the edge. Hence this double system of forces can be resolved into a series of shear forces along the edge (Fig. 10). These shear forces may be summed as a simple force per edge (Fig. 11) and an edge beam is required to carry this force. Edge beams should be placed half above and half below the shell. If, however, it is required to have them completely above or below then this can be done, but the overall cross section of the beam will have to be increased.

If the shell is made too shallow there will be a tendency for it to buckle and we must limit the ratio of the rise of diagonal / span of diagonal. This ratio should never be less than 1/15 and should be as large as possible.

Practical Application of the Surface

We must now consider how to support the roof and transmit the edge forces to the ground. The method of support will depend on whether single panels (e.g., Fig. 13) are used or whether panels are grouped together (e.g., Fig. 15).

For simplicity consider a single panel. Only two supports are required.

If the roof is put on vertical columns at B and D (Fig. 11) then the edge beams are in compression and the forces P to be taken at the supports may be resolved into a vertical downwards force V and a horizontal outwards force H (Fig. 12). The vertical force is easily dealt with since it is transmitted directly down through the column to the ground. The outwards horizontal force can be dealt with in one of three ways. Firstly the column can be designed as a buttress and resist the bending stresses caused by the horizontal force acting at the top of the column. This is the method used in the Scott Bader Conference Hall illustrated in this issue. Secondly, points B and D may be tied together (Fig. 13). In the Sprites Lane School, Ipswich, a mild steel tie rod has been used. In the third method the shell is supported at the high points (A and C) and the edge beams are in tension. The vertical columns increase as the height of the column and the horizontal component, which is now inwards, is resisted by a strut running from A to C (Fig. 14).

The most economical of these three methods is the tie. The tie has the disadvantages that it may spoil the appearance of an interior and that it may cause an obstruction of clear head room above the column level.

The buttress is in many ways the neatest solution but will be costly if the columns are high, since the bending stresses at the bottom of the columns increase as the height of the column increases.

The use of a strut has the advantage of giving a clear underside of the shell combined with small columns. This method is being used in the design of a proposed church at Dallington (Architects: Sir John Brown, A. E. Henson & Partners).

In multiple units it is often possible to use one shell to resist forces exerted by its neighbour. In Fig. 15 the forces along the ridge members balance each other and it is only necessary to restrain the four corners. This can be done with buttresses or by the use of ties around the perimeters (shown as a dashed line). It should be noted that the forces only balance if the panels are equally loaded and this method should be avoided.

One shell can successfully be hung from its neighbour. In Fig. 16 a support is required at D to resist the downward component of force Q. The downward component of force P can be resisted by a column at H, which may prove inconvenient, or by providing a hanger (shown dashed) to transfer the force to the edge beams of the rear two shells.

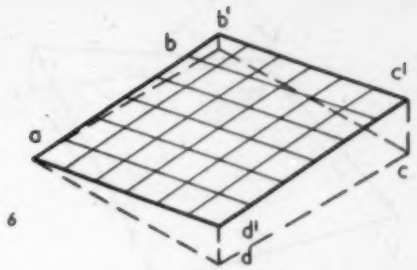
The use of horizontal edge members should be avoided unless they are supported at both ends (as in Fig. 16) since a deflection due to self weight may result in a downwards component of a force with no support to resist it, (e.g., on the ridge in Fig. 15). Nominally horizontal edge members should therefore have a slight upwards inclination.

The panels may be arranged in numerous ways and a few examples are given in Fig. 17.

Materials

The majority of the hyperbolic paraboloids completed in this country have been constructed from timber, the remainder being concrete.

Timber has several distinct advantages over concrete, one of the most important being self weight. A 60ft square timber shell will be approximately 2in thick giving a self weight of 5lb/sq ft. The comparable concrete shell will probably be 2½in thick, (cover of the reinforcement being the governing factor in determining the thickness) with a self weight of 30lb/sq ft. The use of timber leads to smaller loads on the foundations and



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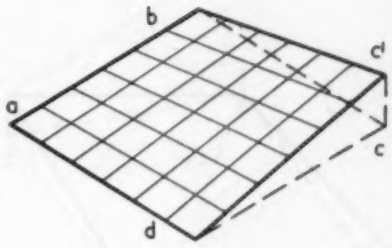

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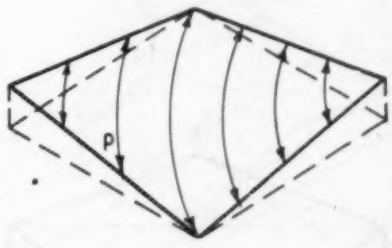

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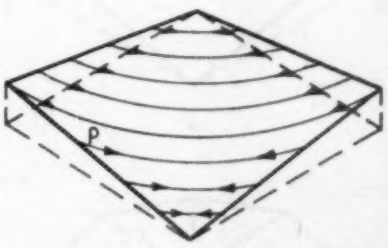

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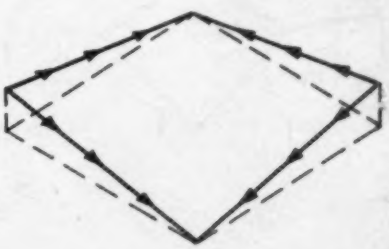
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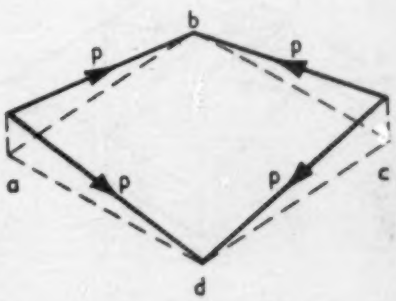

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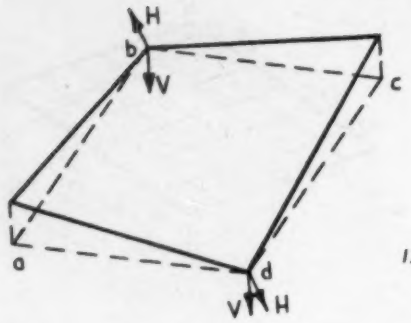
HYPERBOLIC PARABOLOID ROOFS



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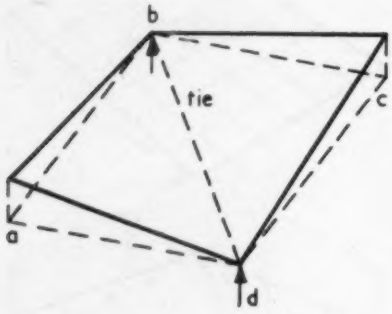

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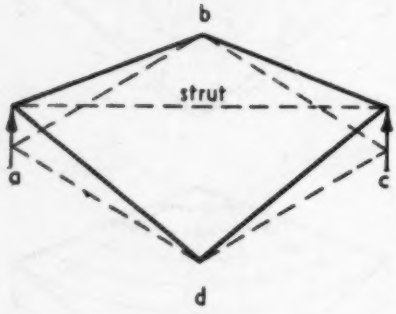

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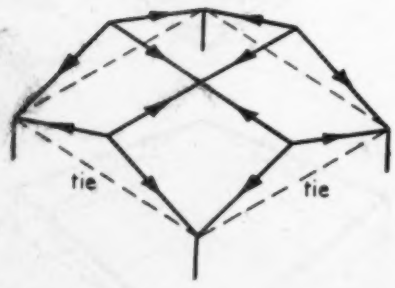

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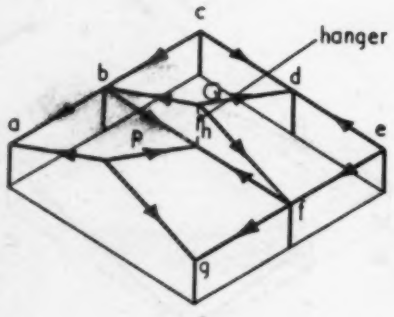

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a consequent saving in cost. When the ground conditions are poor, timber will also have considerable advantage.

When we discussed the geometric properties of the surface, it was pointed out that the surface was "ruled" and that straight lines existed on the surface. The natural consequence of this property is to build up the membrane of the shell by laying straight boards of timber along these lines. The timber makes natural use of an inherent geometric property of the surface.

Other factors to be borne in mind in choosing the material will be discussed at the same time as the construction problems.

Construction Methods

The method of construction will depend to a great extent on the material used. If concrete is used the construction will be predominantly on the site whereas timber construction will be partly on the site and partly in the factory. The use of complete prefabrication has not yet been investigated in this country, but in this field the low self weight of timber would be an advantage.

The concrete shell would have reinforced edge beams with a reinforced membrane forming the shell. In order to cast the shell a system of tubular scaffolding will have to be built up to the required height and covered with a layer of timber boards. This scaffolding will have to be maintained in position throughout the curing period of the concrete which will probably be from 2 to 3 weeks. Since this technique does not differ from that employed in the construction of circular cylindrical shells no further comment is needed.

The construction of timber shells is a much newer technique and the process is worthwhile describing in greater detail. For exact details of the construction, reference should be made to the articles in this issue describing two completed buildings. The remainder of this article picks out the salient points of the general problem.

The edge beams of the shells may either be cut from solid timber or laminated. Solid timber will only be used in the case of small shells, up to say 20ft square. The majority of edge beams will be fabricated in the factory from glued laminated timber. Care must be taken in specifying the correct type of adhesive, the final exposure conditions of the beams being the critical factor. If the beams are to be placed in a position completely free from moisture then a casein adhesive is suitable, whereas in unprotected exterior locations or positions of adverse moisture conditions, a resorcinol formaldehyde adhesive is recommended. Site glueing is not at the moment recommended but research work at present being undertaken on adhesives seems likely to overcome this restriction. If site glueing is being considered the adhesive manufacturer should be consulted at an early stage. The transportation of the glued laminated edge beams, say 65ft long, may in some circumstances be a critical factor. One final point to remember is that the slope of the shell varies along the edge beam and the beams consequently have to be laminated with a twist in them, or specially cut to match this varying slope.

The shell itself is made of a number of layers of boards placed in different directions and nailed together. For shells up to 25ft square only two layers of 1in boards are needed; for larger shells 3 or more layers of ¾in boards are required.

When 2 layers of boards are used they should be laid in directions parallel to the diagonals. In the case of three layers the top and bottom boards should be at right angles to each other and parallel to the edge beams, the third layer being placed between them and in a diagonal direction. The buildings illustrated in this issue give details of both 2 and 3 layers.

The boards are nailed together (nail spacing varies but is generally about 5in centres) and to provide added stiffness to the shell a zone adjacent to the edges is also glued. Site glueing in this case is permissible since added stiffness, rather than strength is required.

Since stiffness is the governing factor in determining the thickness of the shell, the lowest quality of boards available may be used.

The edge beams are coach screwed to the boards of the shell.

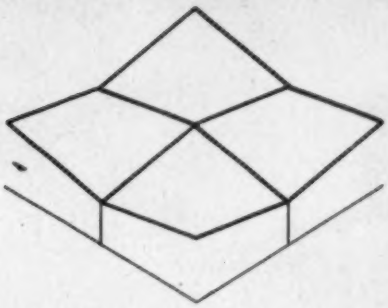
If, instead of buttresses, ties are used to restrain the corners, the intersection of the tie and the edge beams must be carefully designed. The tie will generally be of mild steel and at its intersection with the edge beams a metal anchor plate must be provided. In order to limit the deflection of the tie under its own weight, it is advisable to use hangers. Single vertical hangers are not recommended since they provide very little lateral restraint in the event of a sideways blow. Double hangers in the form of a V are a suitable solution.

Since the self weight of the roof is small compared with possible upwards forces due to wind, the roof must be

adequately held down at the supports. If the building is left open on the sides after completion the wind forces will be unevenly distributed on the roof and the unsupported corners of the building should be tied to the ground. When the building is designed to have walls on all sides, the edge beams should be fastened to the walls to provide resistance to wind forces. During erection care must be taken in tying down the corners of the building to resist wind forces.

The method of erection is straightforward and quick. Tubular scaffolding is provided to the underside of the shell. The bottom half of the edge beam is first put in position, followed by three layers of boards, and finally the top half of the edge beam. The scaffolding may then be removed and the felting of the shell begun. Thus another advantage of timber over concrete is that there is no curing period and scaffolding costs are lower.

The overall conclusions are that in the construction of hyperbolic paraboloid shell roofs timber has the considerable merits of low self weight, light foundations, rapid and easy erection on site combined with the possibility of complete prefabrication.



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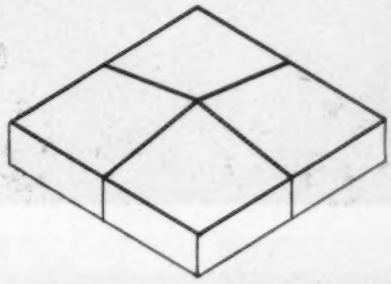

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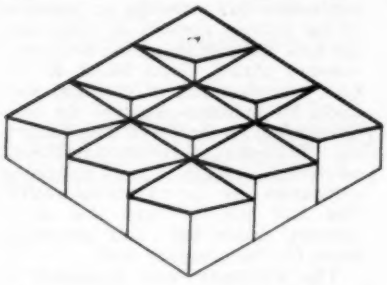

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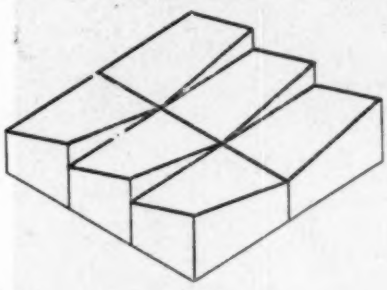

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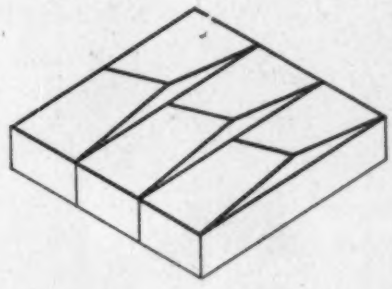

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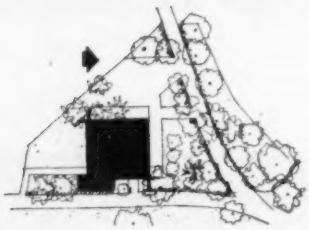
SCOTT BADER CONFERENCE HALL, NORTHANTS

Architects: SIR JOHN BROWN, A. E. HENSON AND PARTNERS
Partner in Charge: C. FEATHERSTONE. Project Architect: J. WARREN
Structural Consultant for Roof: DR. L. BOOTH
Structural Consultants for Buttress: WALTER C. ANDREWS and PARTNERS

Low point of the roof, and movable screen

High point of the roof, and movable stage

Kitchen block on the south-east corner



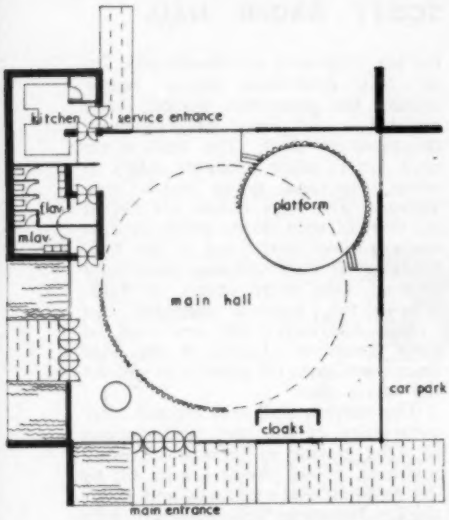
SCOTT BADER HALL

THE application of a timber hyperbolic paraboloid roof to this conference hall provides an example of the buttress method of supporting the shell and restraining the horizontal outward thrust. Scott Bader & Co. Ltd., manufacturers of chemical products for industry, required the conference hall on the site of their factory at Wollaston, Northamptonshire, to receive visitors from associated companies in the Commonwealth. The hall will be used also as a canteen, dance hall, and recreation room for the company staff.

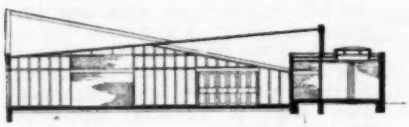
The architects were requested to produce a cheap building to be constructed in a very short time, and which would be in harmony with adjacent historical buildings. The conference hall is placed in a dramatic setting of tall trees, forming part of the grounds of Wollaston Hall in which the company offices are situated.

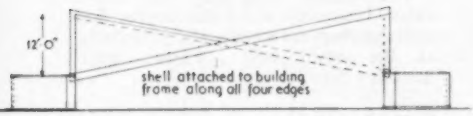
Construction

A 4ft ground slope was levelled to receive a 4in concrete floor slab. The paraboloid roof is supported on two reinforced concrete buttresses, faced in brickwork, which are taken 8ft below finished floor level and carry the total load of the roof. This load is approximately 20 tons weight and 75 tons thrust on each buttress. The building is clad entirely in non-loadbearing timber curtain walling. Construction of the timber shell is three layers of ¾in tongued and grooved boarding, with vee-joints on the bottom layer to emphasize the line of the board runs. The bottom layer is edge stapled together. The board runs of the centre and top layers are rotated through 45 deg. from each other, nailed with 1¾in and 2¾in rustproof nails respectively, and bonded with Casco casein glue for a width of 8ft around the perimeter. This grade (1188) has been specially developed for timber engineering work and contains fungicide for protection against mycological attack. The glue is supplied in powder form which is simply mixed with cold water

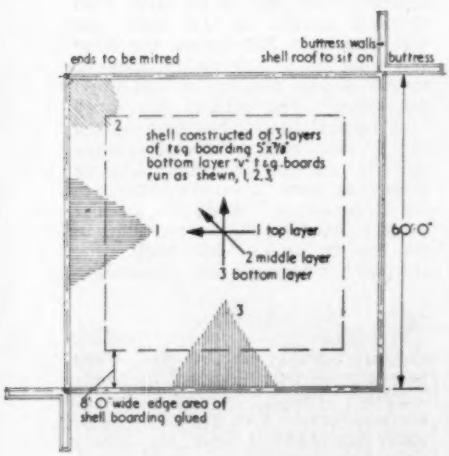


PLAN & SECTION. SCALE : 1 IN=32 FT

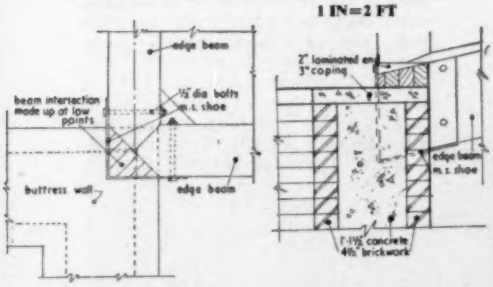




ROOF PLAN & SECTION



BUTTRESS DETAIL **SCALE : 1 IN=2 FT**



Placing the first layer of boards

The second layer, placed diagonally

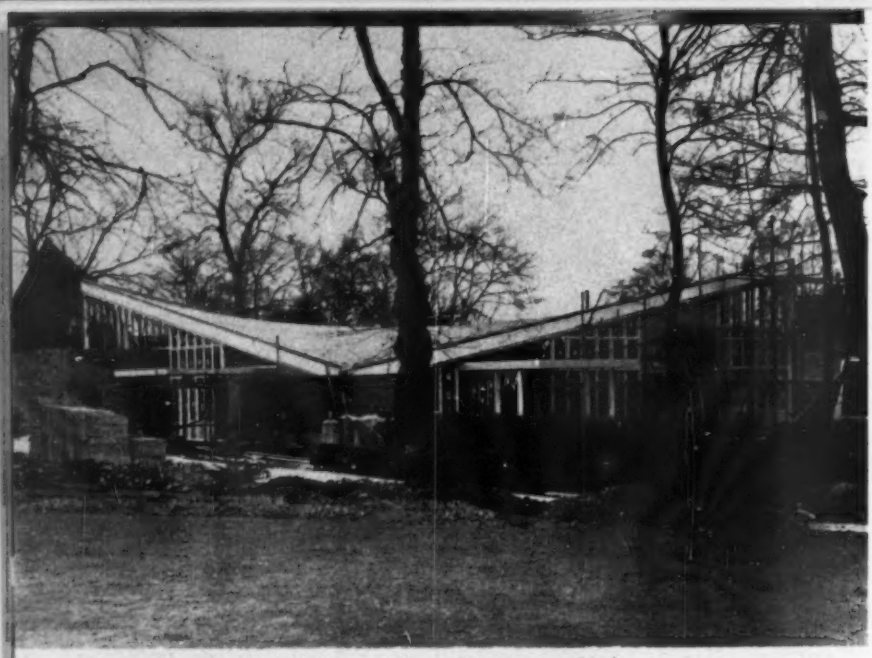
General Contractors: **W. THOMPSON & SONS**

Sub-contractors and Suppliers:

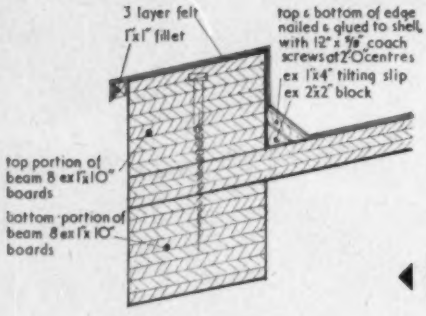
Accotile Flooring: **A. R. & W. Cleaver Ltd.** *Bricks:* **National Coal Board.** *Chairs and Tables:* **Ercol.** *Clear Emulsion:* **Scott Bader & Co. Ltd.** *Curtain Track:* **Silent Gliss Ltd.** *Electrical Work:* **Barnett & Soans Ltd., Wellingborough.** *Flooring:* **Hollis Bros., Leicester.** *Glazing:* **A. R. & W. Cleaver Ltd.** *Ironmongery:* **A. R. & W. Cleaver Ltd.** *Lighting Fittings:* **Falk Stadelmann & Co. Ltd.** *Roof Felting:* **Engert and Rolfe; Cambridge Asphalt Co.** *Sanitary Goods:* **Clarke Hunt & Co. Ltd.**

The completed roof before erection of the panel walls

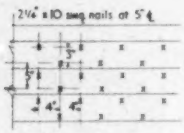
SCOTT BADER HALL



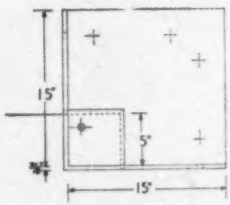
The completed building with panel walls assembled



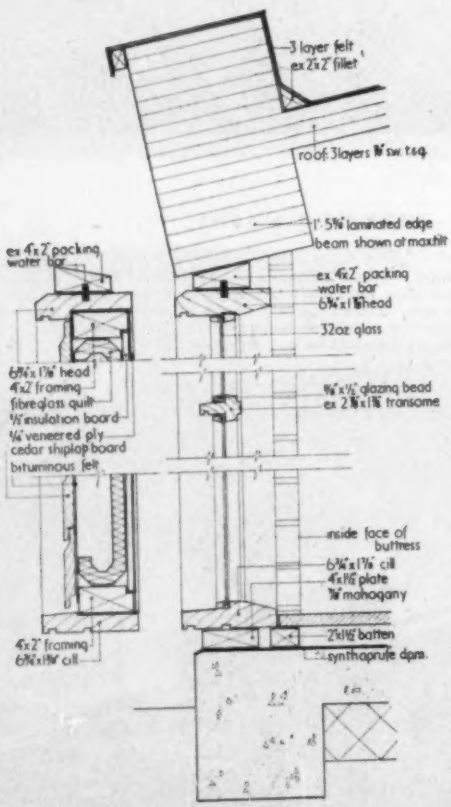
EDGE BEAM SECTION



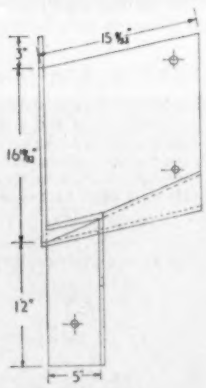
NAILING PLAN

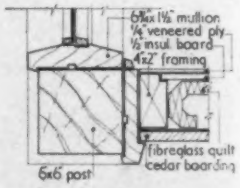


PLAN & SECTION OF M.S. SHOES



INFILL WALLS
SCALE: 1 IN=1 FT





for use. The roof is stiffened with 7in by 10in laminated timber beams around the perimeter, placed above and below and joined integrally with the three-ply shell. The shell is set back ½in to allow a timber insert to cover any end grain which may appear. The edge beams are bolted on to mild steel shoes which in turn are anchored at the top of the buttresses. The shell and edge beams are finished with three layers of bituminous felt, mineral surfaced, and treated internally with one coat of clear emulsion. Faces of the edge beams are gloss oil painted to protect the casein glue.

The curtain wall was erected after completion of the roof, and consists of 32oz glazing in painted softwood mullions. Solid panels are of 4in by 2in studding clad externally with cedar shiplap boardings and internally with mahogany veneered plywood, insulated and waterproofed by bituminous felt, in Fibreglass guilt, and ½in insulation board. The curtain wall is secured to the floor slab by a timber sole plate, coach screwed to timber inserts. All timber below furnished floor level is pressure creosoted. Flooring is Keruing hardwood strip on a bituminous membrane.

The kitchen block and chair stove have 11in cavity walls and timber flat roof finished externally and internally as the main hall. Floor: grey Accoflex tiles.

Furnishings

The circular stage is mounted on large castering wheels, and can be moved to any part of the hall. Two movable screens 8ft 3in high, one 30ft long on a 20ft radius, the other 18ft long on a 12ft radius, may be moved to any position to sub-divide the space. The screens are faced with vertical timber boarding on the convex side, and perforated acoustic tiles on the concave side. Cinema projection ports are incorporated in the large screen. A double circular track is fixed to the lowest point of the ceiling, to provide back drop curtains for the stage and proscenium.

Services

Heating: by three-tier electric tubular heaters around the whole perimeter of the building. Lighting: Tungsten fittings suspended around the perimeter. Two groups of flood lights are directed upon the timber ceiling, indirectly lighting the hall.

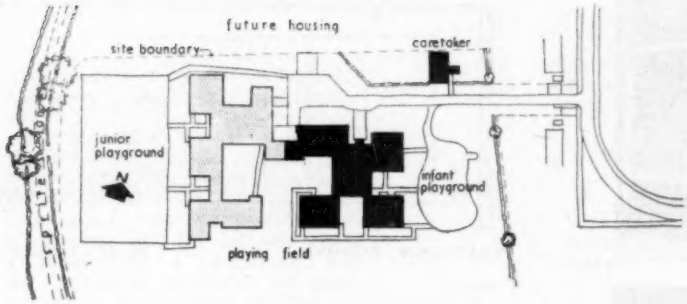
A rainwater collecting pool is provided in the foundation of a buttress, which takes rainwater from the main roof via a reconstructed stone gargoyle at coping level.

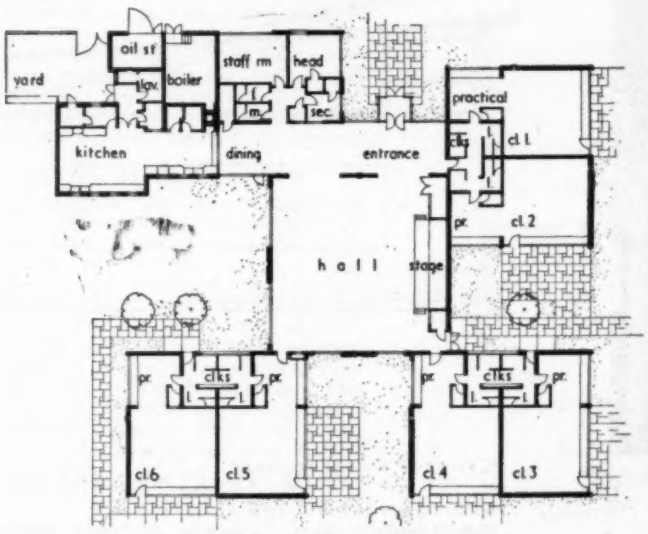
Cost: the tender figure was £10,877, and the final cost is expected to be less. Cost of the roof and curtain wall complete: £4,370. Total cost per sq ft 55s. Total cost per cub. ft 3s 7d.

SPRITES LANE SCHOOLS, IPSWICH

Architects: JOHNS, SLATER AND HAWARD

Roof Consultants: TIMBER DEVELOPMENT ASSOCIATION LTD.





INFANT SCHOOL SCALE: 1 IN=48 FT

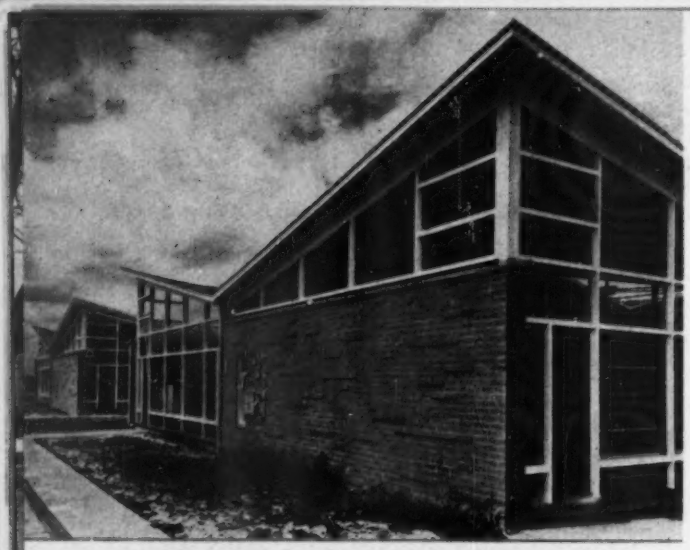
THE structure of Sprites Lane Primary Schools, Ipswich, is composed of a series of hyperbolic paraboloid roofs, using twin-boarded shells and the tie rod method of restraining the horizontal outward thrust.

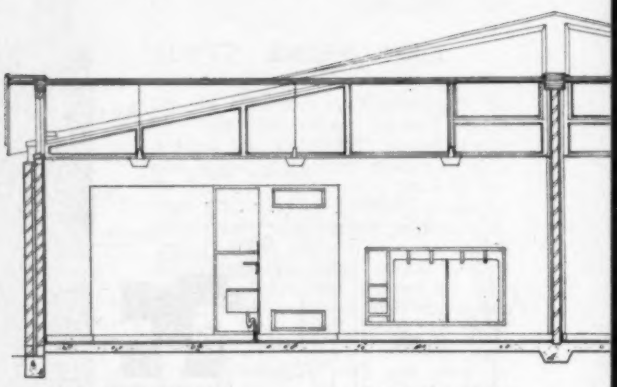
The schools are on the Chantry Estate adjacent to London Road, serving a large and expanding area of council housing, and providing accommodation for 240 infants and 320 juniors. The infants' school has six classrooms and the junior school eight classrooms, and both are two-form entry schools. The construction of the infants' school section is now nearing completion and the six classrooms are already in use by the school. Work has commenced on the junior school, which will be completed in approximately twelve months.

Planning

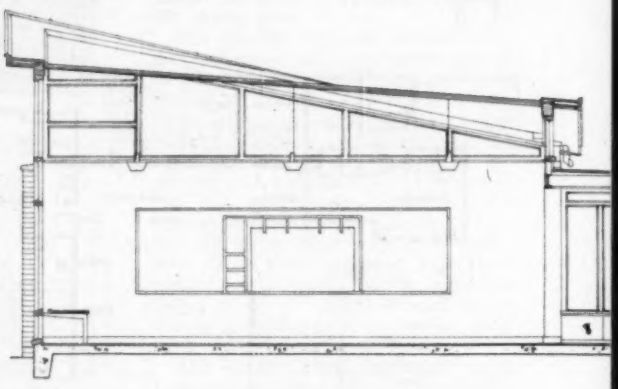
In the planning of the schools, corridor access has been eliminated entirely. Each school is grouped around a 50ft square assembly hall, with direct access to the classrooms which are designed in pairs around the perimeter. The classrooms have self-contained coat-hanging and lavatory accommodation, and adjoining practical space with sink and storage cupboard, producing a total area of 800 sq ft per classroom. Each class-

The infant school and playground





CLASSROOM SECTIONS. SCALE : 1 IN=8 FT

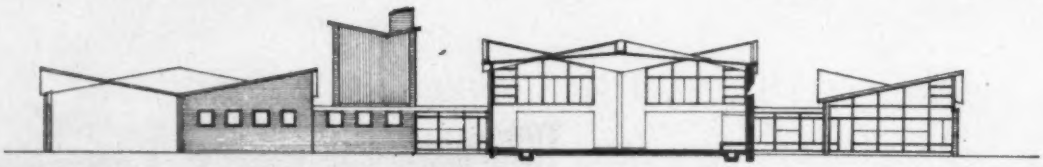


A typical classroom, looking towards the adjoining practical space and cloakroom. Light fittings are suspended from the structural tie rods

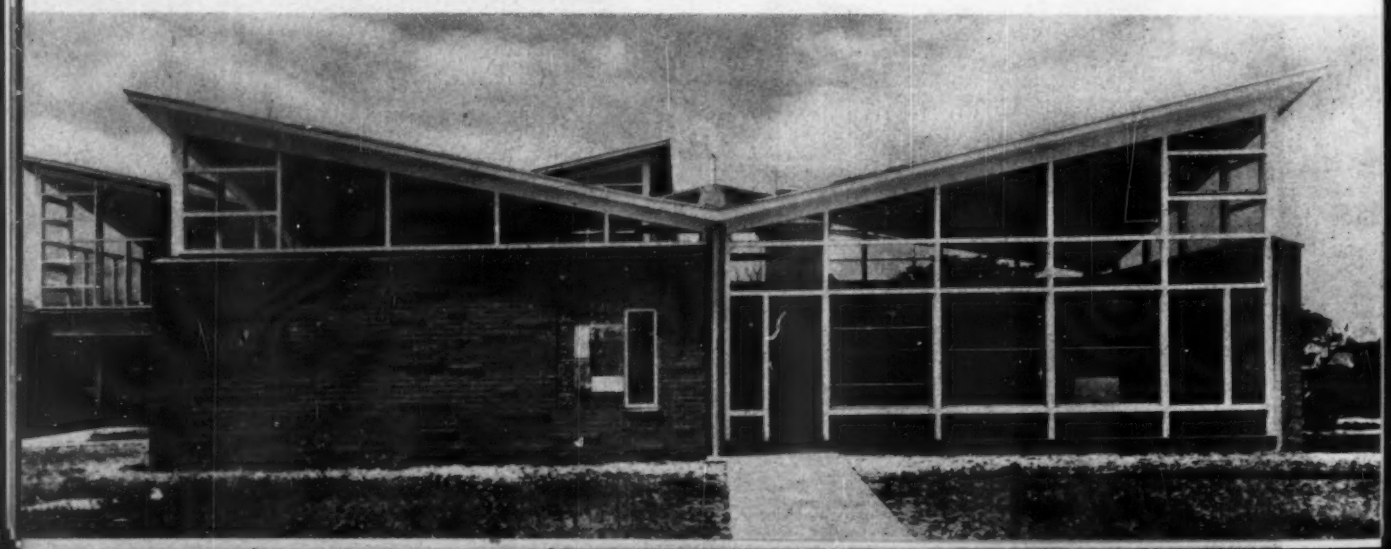
General Contractors:
G. A. KENNEY & SONS LTD.

Sub-contractors and suppliers:

Electrical Installation (Infants): Christy Bros. *Felt Roofing:* Limmer & Trinidad Lake Asphalt Co. Ltd. *Flooring:* Granwood Flooring Co. Ltd.; Marbolith Flooring Co. Ltd. *Heating and Hot Water Installation (Infants and Juniors):* Norris Warming Co. Ltd. *Hyperbolic Paraboloid Roof Constructors:* Wheelers (Sudbury) Ltd. *Hyperbolic Paraboloid Consultants:* Timber Development Association Ltd. *Ironmongery:* Dryad Metal Works Ltd. *Sanitary Fittings:* Adamsez Ltd.



ASSEMBLY HALL
SCALE : 1 IN=32 FT



SPRITES LANE SCHOOLS

room communicates with the assembly hall via a V.H.F. broadcast installation.

The schools are joined by a central kitchen which serves directly into both dining halls, and is capable of producing 350 meals per day. Each school has its own large asphalt paved playground, and the infants' school in addition has a sandpit and ball wall. Concrete sculptures are incorporated in the entrance walling and externally on each classroom wall. A new access road from Stonechat Road serves both schools and a new three-bedroom caretaker's cottage has been built near the entrance. A large area to the south of the buildings will form the playing field for the schools.

Construction

The timber shell has two layers of 4in by 1in nominal boards, with the top layer running along the high points of the paraboloid. Edge beams are laminated 6in by 1in boards, placed above and below the shell. The roof is supported on reinforced concrete columns, and held down by rag bolted steel angles. The tie rods are ¾in dia. macalloy bars which are anchored to the steel angles. Infilling walls are either red facing brick or glazed timber screens, with aluminium vertical sliding sash windows.

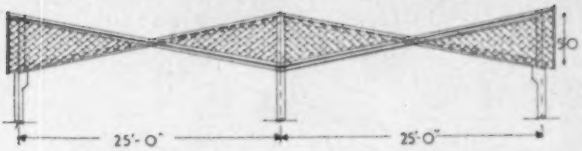
Finishes

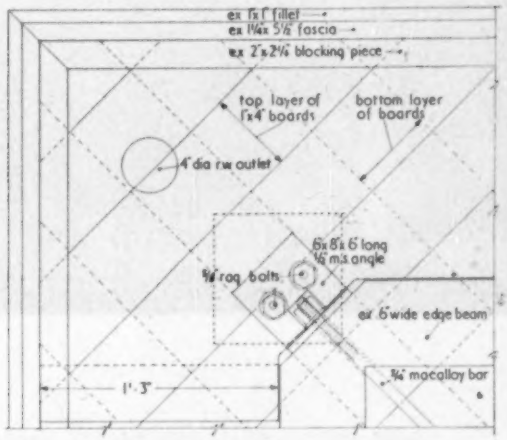
Classrooms have composition block flooring, and plastered and painted walls. Cork flooring is used in assembly halls. Pastel shade painting is used predominantly, only small areas are emphasized by strong colours.

Services

Heating: Warm air convectors assisted by fans, and radiators served by automatic oil-fired boilers. Lighting: Tungsten fittings are used throughout, with recessed fittings under flat roofs, and suspended fittings hung from the tie rods under the hyperbolic roofs.

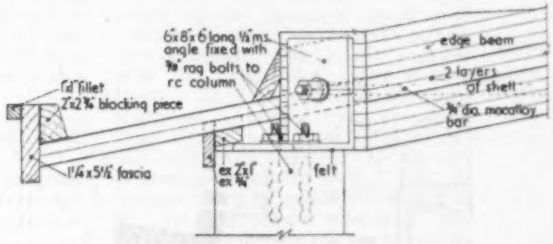
Drinking fountains are provided inside and outside the building. Cost: The total cost of both schools is approximately £101,440.



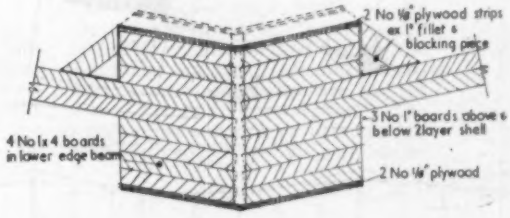


PLAN OF COLUMN FIXING

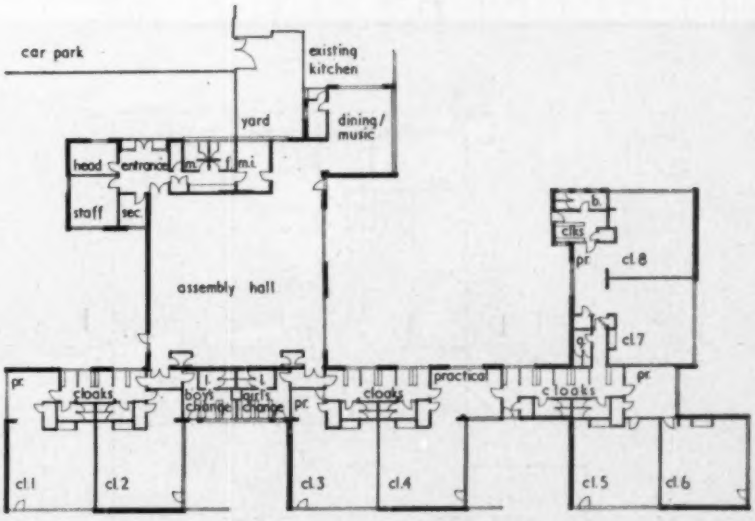
SCALE: 1 IN=1 FT



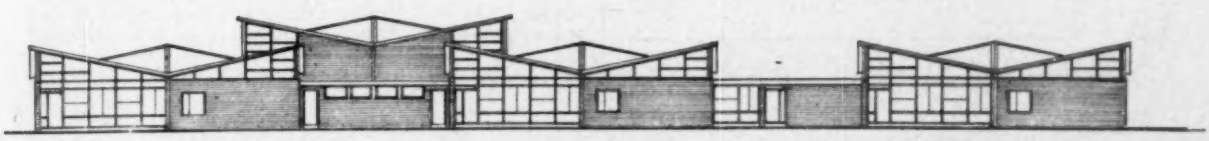
COLUMN AND EDGE BEAM

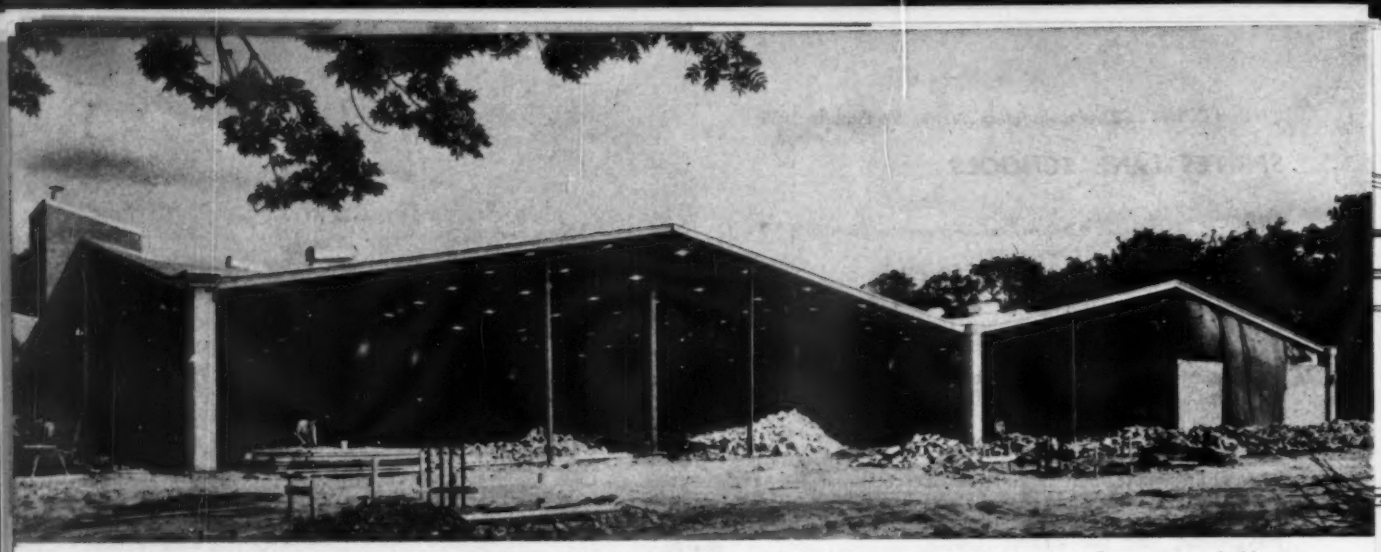


DOUBLE EDGE BEAM 1½ IN=1 FT



JUNIOR SCHOOL PLAN AND WEST ELEVATION

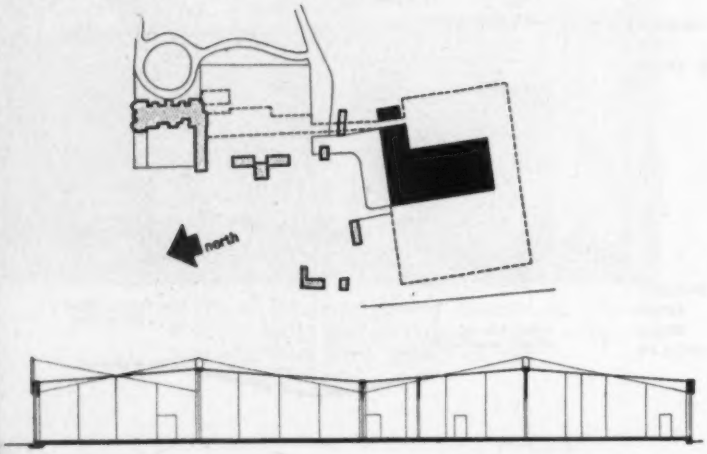


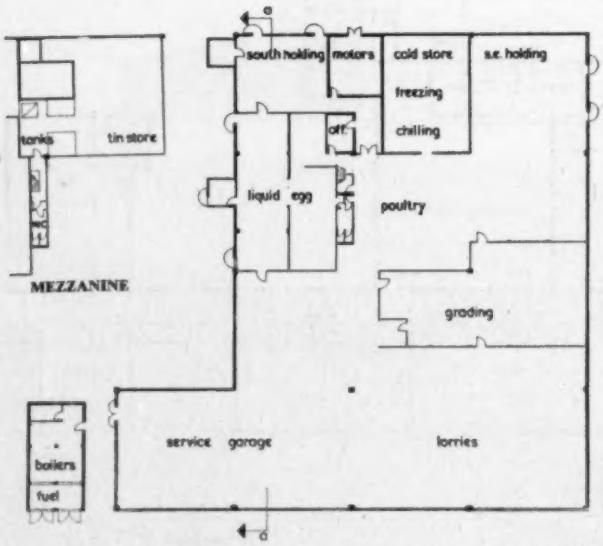


Completion of the first stage, prior to erection of temporary cladding

EGG PACKING STATION, STOWMARKET

Architects: JOHNS, SLATER AND HAWARD





GROUND FLOOR
SCALE : 1 IN=64 FT

THE suitability of hyperbolic paraboloid structures for industrial premises where large spans, ease of extension, and low cost are usually prime considerations, is demonstrated in the construction of this Egg and Poultry Packing Station at Haughley Park, Suffolk. The area of the first stage is 18,000 sq ft made up of nine bays, each 45ft sq. A four-bay extension is in progress of construction, and a further extension is planned which will bring the total area up to 56,000 sq ft. The roof shells are supported at the low points on columns at 90ft centres in one direction, and 64ft across the diagonal. The tie rod method of restraining the horizontal thrust of the shell is used.

Site

The clients, John Rannock Ltd., have an existing packing station at Elmswell which will eventually be closed down, and a new site of 65 acres of parkland was acquired at Haughley Park. A large sixteenth-century house exists on the site which will be used for offices and living accommodation for a director.

Planning

The first stage of the packing station will cater for the processing of liquid egg, and refrigerated storage. The stage now being erected will house both processing of poultry and the grading of shell eggs. Future extensions will simply enlarge these three production departments. The client required large unobstructed floor areas to allow storage of the egg and poultry crates, and to facilitate reorganization in the event of a future change in processing methods. Other requirements were a relatively

The paraboloids permit unobstructed floor space

cheap structure, ease of extension, and the avoidance of complicated roof members for reasons of hygiene. After research into the various types of structure the timber hyperbolic paraboloids were chosen as the best solution to the above requirements. The liquid egg processing and the grading departments for poultry and shell eggs take place at the centre of the factory, surrounded by holding areas where the incoming and outgoing crates are stored. The loading bay is on the north side, and refrigerator storage on the south side. A mezzanine level tin store is provided over the refrigeration rooms.

Services

As the site is in a country district a self-contained sewage plant has been built to cater for the processing wastes and sewage. The water is obtained from a borehole yielding 10,000 gallons per hour. The sewage plant is located in a natural hollow on the north-east side of the packing station, and a 70ft diameter filter is provided at this stage and two further filters are planned.

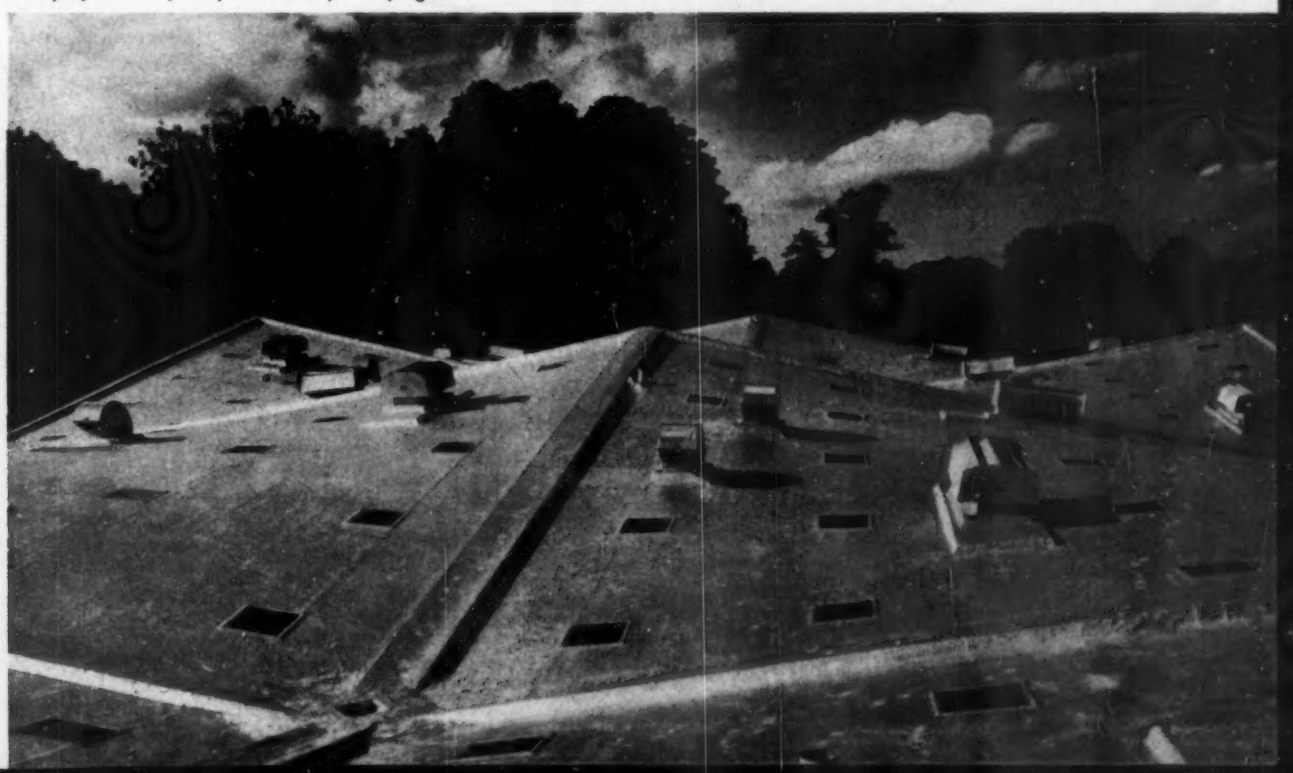
A high pressure steam boiler provides processing steam, hot water and heating.

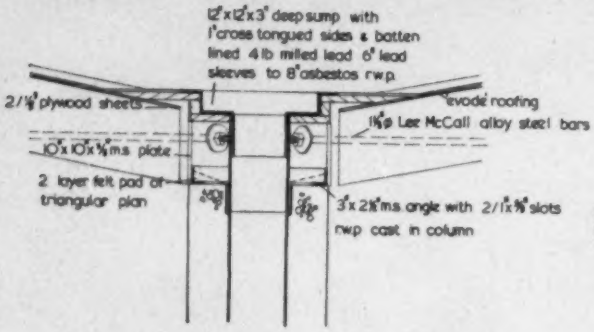
A fire alarm system is installed, linked to the G.P.O. exchange. Extract and inlet ventilators are provided in the roofs and walls.

Construction

The 45ft square paraboloids are supported at the low corners on 20in by 20in R.C. columns, which have 8in diameter R.W. pipes cast down the centre. Roof lights are formed in the shells, 17in square and 25 per bay, producing a daylight factor of two per cent at the working plane. The shells are formed from three layers of ¾in boarding, glued with Aerolite 300 for a width of 3ft around the perimeter, and nailed together over the entire roof. The bottom layer is T. & G. unsorted European Redwood, bowstitched together. Edge beams have five layers of ¾in E.R. boarding, glued to the top and bottom edges of the shells. The low corners are held across the diagonals by 1¼in high tensile steel bars, bolt fixed, and supported at intervals by ¾in steel hangers. The ties occur at 13ft 4in above floor level. A 4in space between the roofs allows for structural movement and houses the electric service runs. All roof timberwork is protected against fire and rot with "Pyrolith" preservative. The wood fibres and cell cavities are impregnated with "Pyrolith" salts under

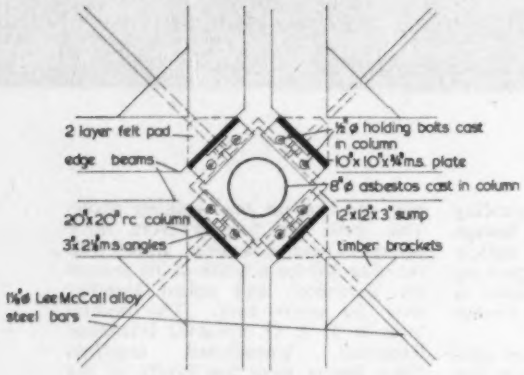
Free perforation of the paraboloids for roof lights and services



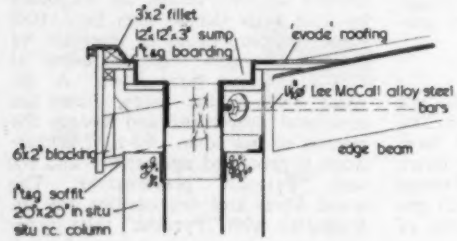


SECTION AT B INTERNAL COLUMN

SCALE : 1 IN=2 FT



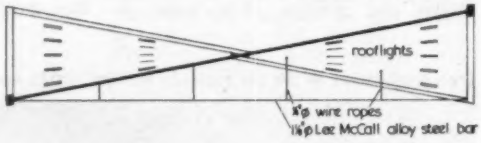
PLAN AT C INTERNAL COLUMN

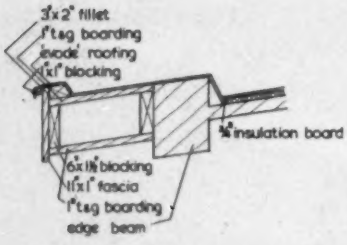


SECTION AT D PERIMITER COLUMN

pressure. When subjected to high temperatures the salts generate water vapour and ammonia gas which, by diluting the combustible gases, raise the ignition temperature and resist flame spread. The shells are covered with ½in insulation board and Evode waterproofing finish with a silver film surface. The resultant "U" value is less than 0·2. Large sliding doors for access on the north side of the packing station are supported from above by 45ft span timber trusses. External walls are temporary screens to allow future extension, of timber rails and steel bracing with corrugated asbestos cladding externally and insulation board internally. The cavity is sheathed in metal-foil backed building paper, resulting in a "U" value of 0·28. Internal partitions are 4½in brick up to 11ft above floor level, with glazed timber top lights, continuing up to the underside of the roofs. When the future extensions are completed and the permanent external wall is in position, similar top lights will be introduced in these external walls. Floors: granolithic, or hydraulic clay tiles.

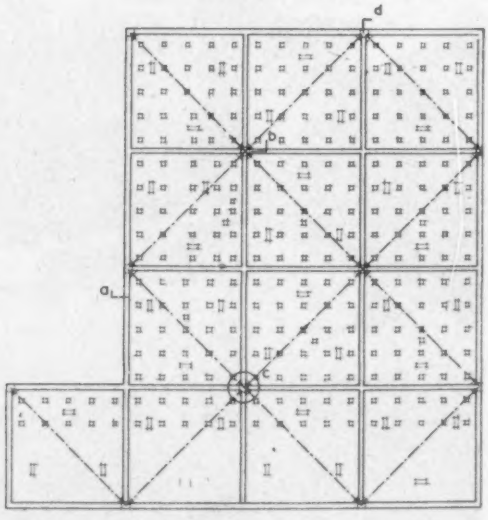
PARABOLOID SECTION

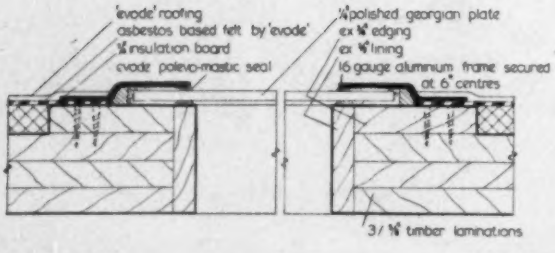




EDGE BEAM SECTION AT A

ROOF PLAN. SCALE : 1 IN=16 FT





ROOF LIGHT SCALE : 1/4 F.S.

General Contractor:
BLACKBURNS LTD.

Sub-contractors and suppliers:

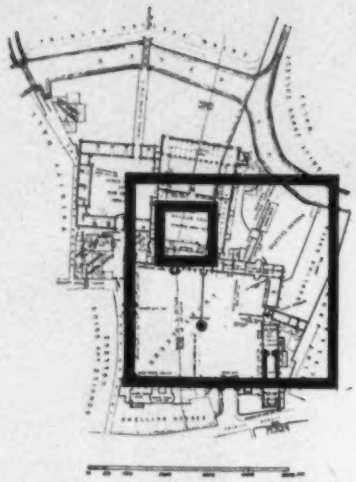
Borehole Installation: John J. Gosling & Co. *Electrical Installation:* Mann, Egerton & Co. Ltd. *Fire Alarm Installation:* Automatic Fire Alarms Ltd. *Heating Installation:* Weatherfoil Heating Systems Ltd. *Hyperbolic Paraboloid Roofs:* Wheelers (Sudbury) Ltd. *Pyrolith Timber Preservative:* Hickson's Timber Impregnation Co. (G.B.) Ltd. *Refrigeration Rooms:* York Shipley Ltd.; Armstrong Cork Co. Ltd. *Reinforcement:* Rom River Co. Ltd. *Roofing Finish:* Evode Ltd. *Sewage Plant Equipment:* William E. Farrar Ltd. *Ventilators:* Colt Ventilation Ltd.

Two views of 45ft span trusses at the north side, which support lorry access sliding doors

EGG PACKING STATION

The boiler house, and temporary cladding on the packing station

Tie rod connections to a main column



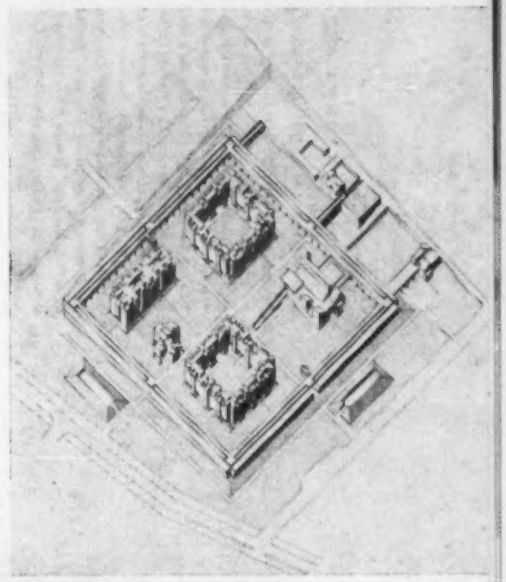
Plan comparison with Trinity

CHURCHILL COLLEGE COMPETITION—II

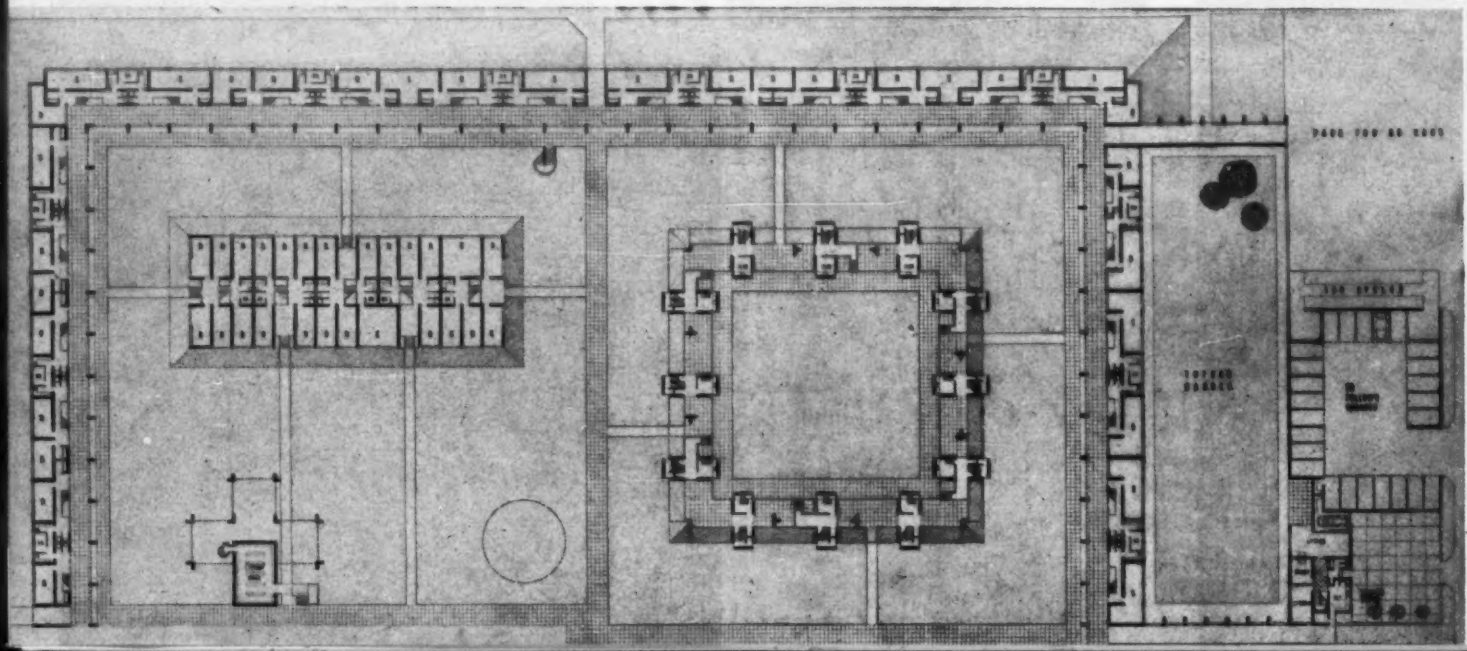
SCHEME BY JAMES STIRLING AND JAMES GOWAN

Assessors' Report

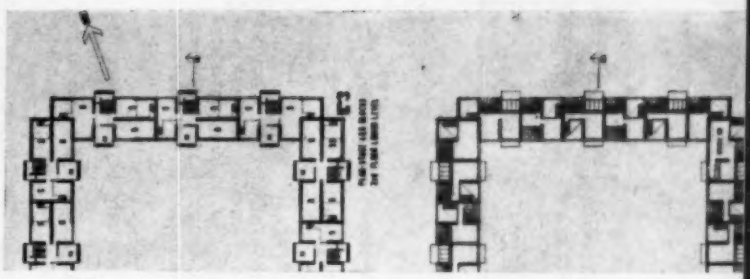
The author of this scheme sets out to provide, on this open site, a walled-in enclosure. A square, considerably larger than the main court at Downing, is surrounded by two storeys of rooms which form the enclosing wall. Two main residential blocks with their own internal courts, a slab block of residential accommodation and a composite building containing Hall and Combination Rooms stand within this great court. These internal buildings will rise above the level of the enclosing peripheral wall of rooms. We think that the architectural ideas is impressive, but the division of the accommodation into long continuous rows of rooms or multi-storied blocks does not seem to us to derive from college usage and desirable groupings of undergraduates within the college. We are also advised that the cost appears to be underestimated.

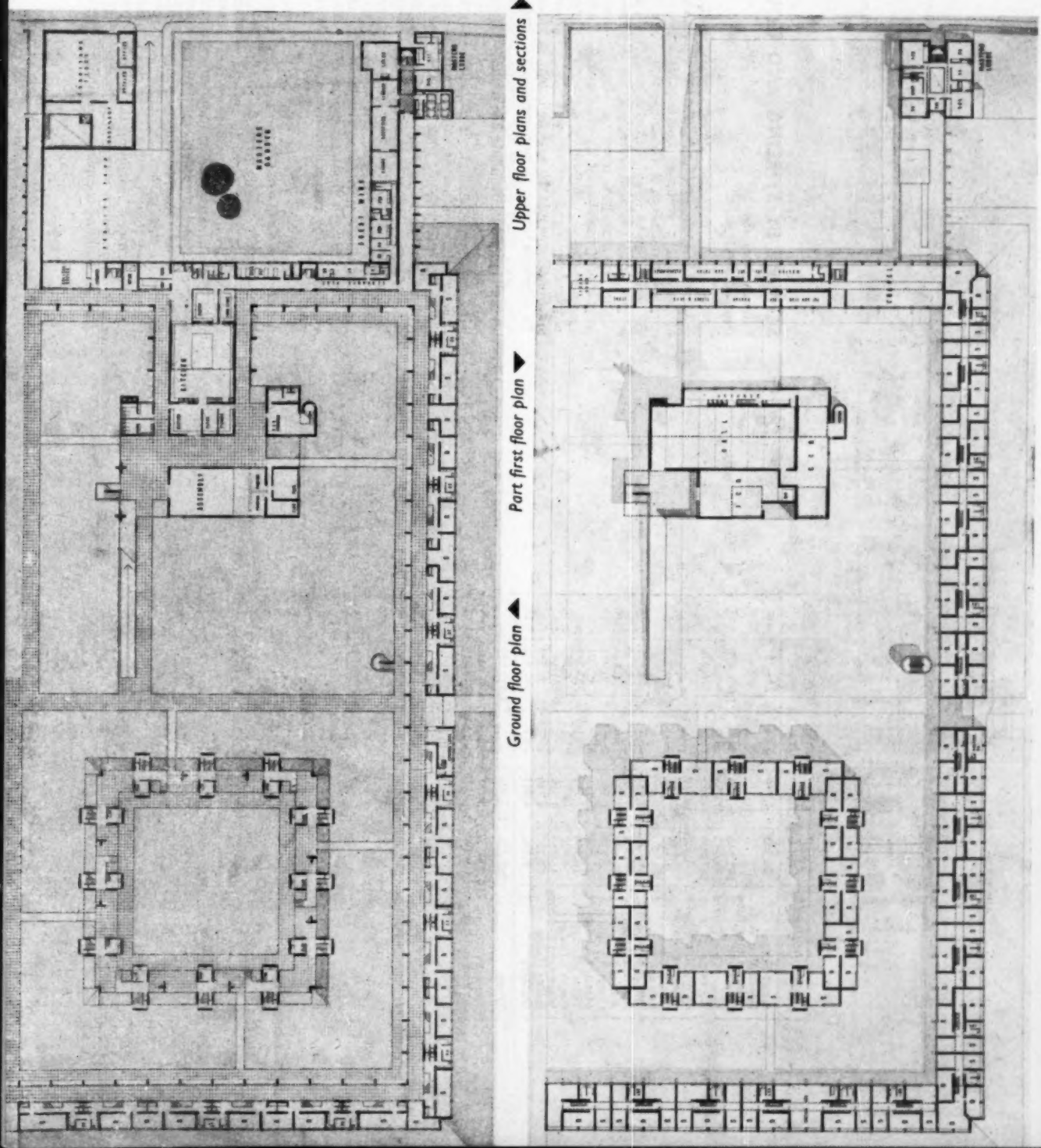


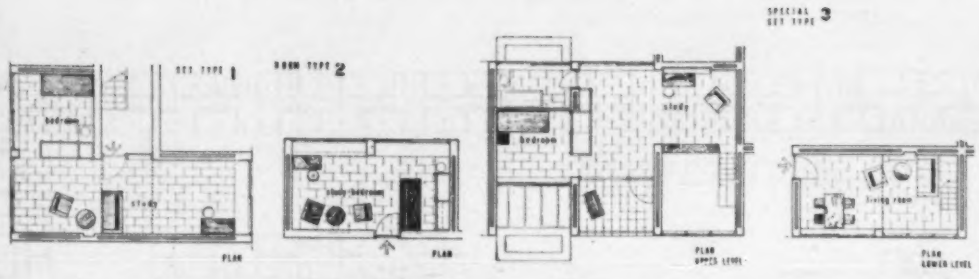
The plan of Trini y College on pages 52 and 56, from Robert Willis's "Architectural History of the University of Cambridge", is reproduced by courtesy of the Cambridge University Press



This week we publish the remaining schemes from stage two of the Churchill College Competition. The schemes are illustrated in a similar way to those last week, and may be read in conjunction with the descriptions and review by R. Furneaux Jordan which appeared in that issue. Next week we will publish a number of interesting designs from stage one of the competition.




Upper floor plans and sections
Part first floor plan
Ground floor plan



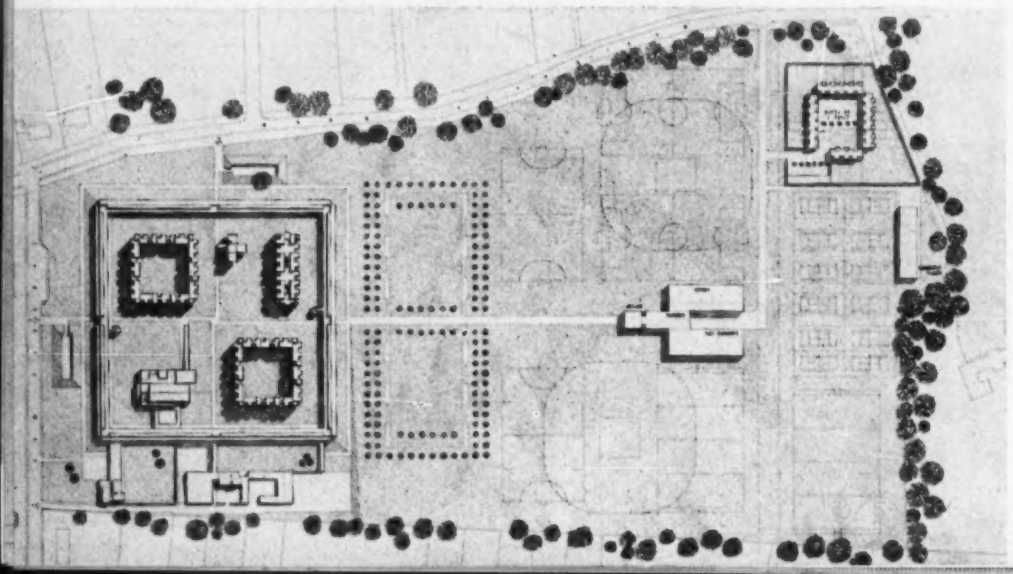
Detail Plans of study, bedrooms and sets

Main Analysis	Total Cost £	Area ft.s.	Cost ft.s.	Cube cu.ft.	Cost cu.ft.
Small Flats ..	46,765	14,774	63/4	213,783	4/4½
Residential Acc.					
Main Outer Ring Block	292,840	66,520	88/1	1,026,010	5/8½
Inner Ring C'yard	284,092	71,056	80/0	946,973	6/0
North South Block	117,805	30,559	77/1	376,976	6/3
Dining facilities & common rooms..	104,848	18,213	115/2	342,360	6/1½
Chapel	7,602	1,534	99/1	20,500	7/5
Library, excl. Bracken Room ..	18,043	2,433	148/4	54,470	6/7½
Bracken Room ..	6,384	989	129/1	14,733	8/8
Administration ..	29,659	7,082	83/9	96,846	6/1½
Guest Accom. ..	5,936	1,544	76/11	30,971	3/10
Master's Lodge ..	17,360	3,911	88/9	49,601	7/0
Tutor's Lodge ..	10,900	2,532	86/1	32,295	6/9
Porter's Lodge ..	1,928	495	77/11	6,563	5/10½
Workshop & Stores	16,659	6,388	52/2	81,596	4/1
Boiler House ..	21,222	4,730	89/9	58,544	7/3
Garages	6,181	4,644	26/7	67,431	1/10
Totals	988,224	237,404		3,419,652	

Cost Analysis

Perimeter planting, £10,000. Layout of grounds, roads, paths, service yard and ramp, covered ways, etc., £78,000. Car parking and cycle facilities, £7,000. Total, £1,083,224.

Site plan



SCHEME BY STIRLING AND GOWAN

Extracts from the Competitors' Report.

The open, flat and almost rural character of the site indicated that in designing a group of buildings as a residential college it was important to create an internal environment, private, enclosed and protected.

The intention to make a single great court, surrounded by residential accommodation using only staircase access, determined that any surrounding building would be low in height. To achieve a degree of monumentality when seen from outside the college, all the buildings including the outer ring have been raised on a turfed bank forming a podium. This is 9ft high at the south-west corner but owing to the rise of the site the podium diminishes in height and at the north-west corner is actually dug in to a depth of 5ft. There are further dominating elements in the later stage buildings whose more complex silhouettes can be seen from all points of view above the parapet of the outer ring.

Accommodation

The flats for college members [stage one in the building phasing] are situated close to the western edge of the site. They are terraced maisonnettes grouped around a garden court, with bedrooms on the upper floors. Each flat has its own garden.

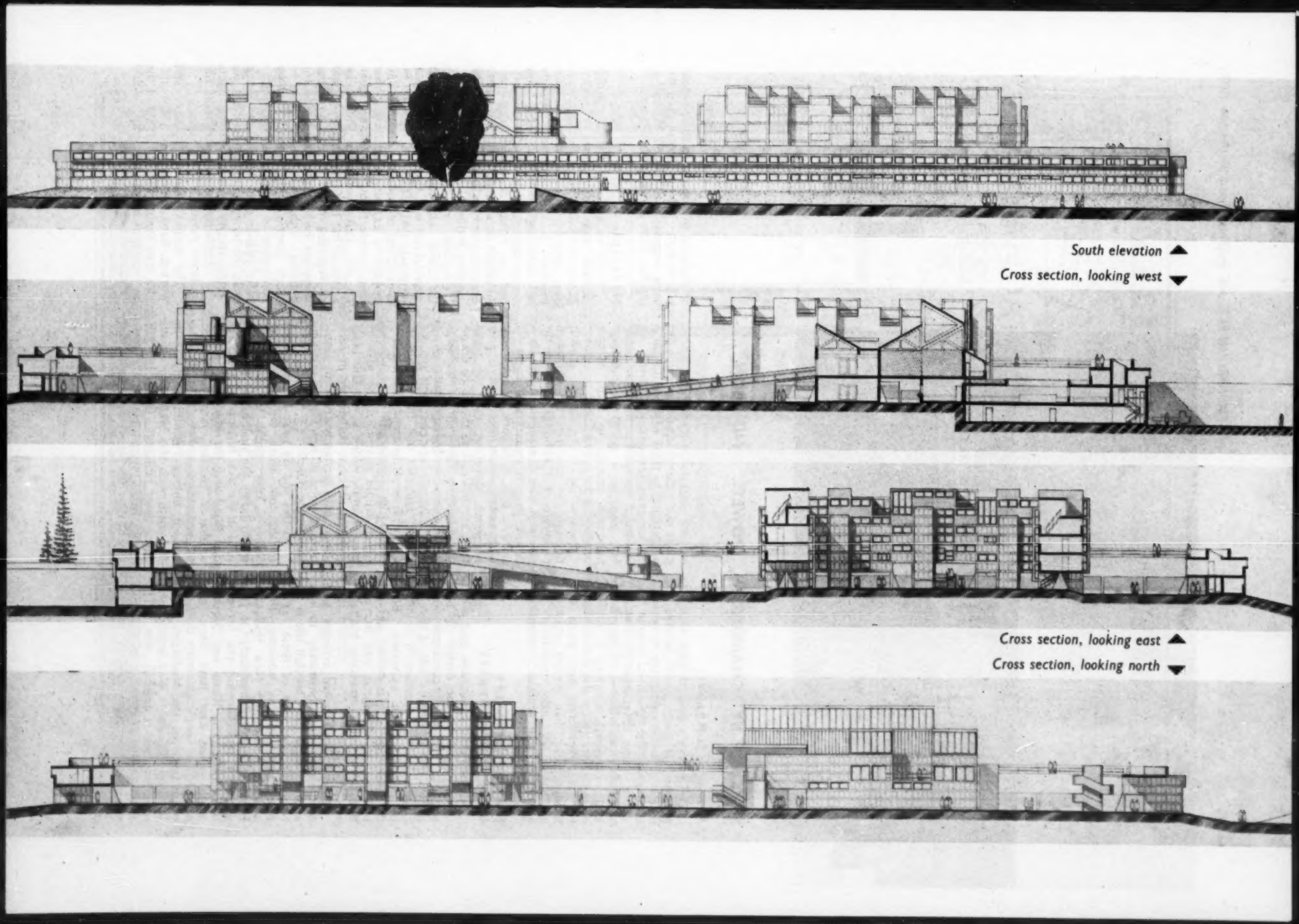
Stage two comprises the outer ring of college rooms, enclosing the great court within which stands the library and a building-complex containing hall, combination rooms, assembly and kitchen. This outer ring will establish the entity of the college at the first stage of building operations.

The cloister which runs completely round the inside of the outer ring gives protection from the weather to members going to all parts of the college. The roof of this outer ring is intended as a high level walk of almost half a mile and access to this terrace is from two free-standing stairs on the east and the west sides of the great court.

Stage three is a free-standing slab block running north-south with the rooms and sets facing either east or west (corner units with south windows), while stages four and five comprise courtyard blocks of residence elevated one storey above the ground to maintain the spaciousness of the great court.

Materials

Flats for married members: Gault facing brickwork, timber windows painted white, roof finish mineralized felt, Paropa roofing on upper terraces. Main residential ring (Great Court); assembly and combination rooms; library; kitchen and stages three, four and five; Portland Stone cladding. Close shuttered exposed concrete surfaces using light sand and aggregate, special windows in hardwood sections oiled and varnished. Flat roofs, asphalt with Paropa terraces.

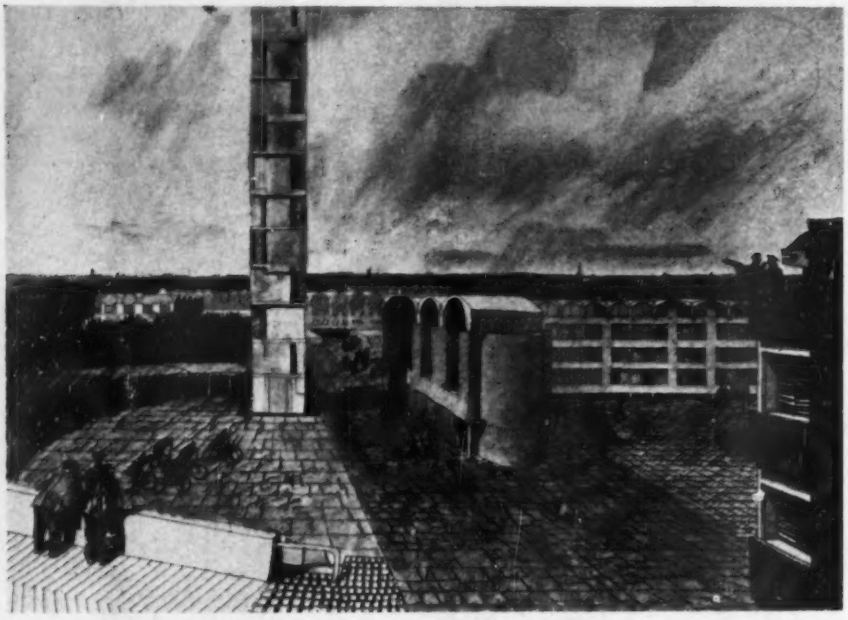


South elevation ▲

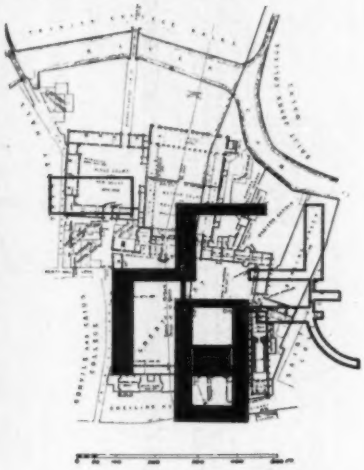
Cross section, looking west ▼

Cross section, looking east ▲

Cross section, looking north ▼



Comparison with Trinity



SCHEME BY CHAMBERLIN, POWELL AND BON

Assessor's Report

The author's general plan with its intermediate sized courts seemed to us at the preliminary stage to be well arranged. The developed scheme has shown some advantages in the detailed planning, which is, on the whole, well considered, although a number of rooms are below the size required, but the elevations and plans are hardly more than outline drawings and gave us little opportunity to appreciate the designer's intentions.

Extracts from the Competitors' Report

Although the conditions laid down are confined to the design of new buildings for a self-contained community on a specific site, Churchill College will not function in isolation but as part of the university. Both the immediate environment of this new college, therefore, and its relationship to other university bui'dings are important.

The long-established colleges gain much from their proximity to one another while the Churchill site is far removed from any of these. Two other new colleges, however, Fitzwilliam House and New Hall, are being planned immediately to the north of the Churchill site between the Huntingdon Road and Storey's Way; other sites have been earmarked for future university development south of the Madingley Road and east of Storey's Way, immediately opposite the Churchill site. The simultaneous preparation of plans for so much college building on the western outskirts of Cambridge, where it has not hitherto existed, presents the opportunity to think of these not only as separate foundations having an accidental proximity to each other but, also, as a group of buildings numerous enough to form a new satellite to the university.

Because of their organic growth through the centuries the collegiate buildings of Cambridge combine to give a picture of a university which—despite its great beauty and charm—is rather a sum of its parts than a whole with variety in its detail. It is now suggested, therefore, that the plans for Churchill college should be drawn up in such a way that the buildings would consciously contribute to a new university precinct; it is not, of course, intended that the identity of Churchill or of the other foundation—should be submerged in any way which would contradict the idea of the corporate nature of the individual colleges, but that the stature of each would gain (certainly from an architectural point of view) by its relationship to the others.

To this end we have looked ahead to the time when the east leg of Storey's Way might be closed to traffic (after the making of the new road in the west linking the Huntingdon Road with the Madingley Road) so that a "parade", largely restricted to pedestrian use only, could be created, linking Fitzwilliam House in the north with the Madingley Road. The new buildings for Churchill would flank this parade on the west while other university buildings could be designed to respond to these across a forecourt. On our layout plan we have suggested, in dotted outline, a possible form of this development.

Materials

While maintaining that the architectural style should be of today, Churchill College must bear examination tomorrow. A sense of permanence is a characteristic quality of university building. For this reason the materials have been specified to reflect a search for permenance combined with twentieth-century architectural values and building methods.

Concrete, reinforced or not, is the most characteristic permanent material of our time and it is our proposal that Churchill should be constructed of concrete, designed and detailed to exploit its qualities rather than to hide them. We do not mean by this that coarseness should be accepted, but that this material should be regarded much in the way that stone has been in the past—good for building with, but which can be much improved in appearance by application of appropriate working.

In order to echo the qualities aimed at in the other building materials, we would specify bronze opening lights . . . . hardwood joinery and brick, tile or stone paving.

The simple, carefully selected and worked, hard materials of the buildings seen against the soft green of the surrounding trees and grass would produce a rich contrast.

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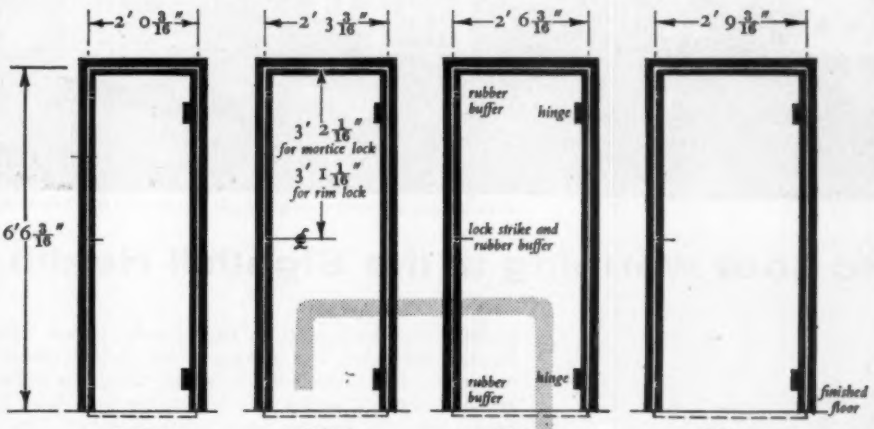

SIZES are taken into rebates at head and jambs, and to finished floor level.

HOPE'S Steel Door Frames are manufactured from zinc-coated mild steel sheet of 18 BG and painted one coat of grey calcium plumbate rust-inhibiting primer before despatch.

Each door frame is provided with the following:

8 galvanized countersunk wood screws.

2 zinc-plated 5-knuckle steel hinges, one leaf welded into the frame and the other assembled with loose sherardized pin.

1 hot-dip galvanized adjustable lock-strike plate with mortar guard.

3 rubber buffers or shock absorbers are inserted in rebate of the lock jamb.

Base-ties are of heavy corrugated steel and are adjusted before despatch to set frame to level of finished floor.

Floor fixing plates are provided at bottom of each jamb.

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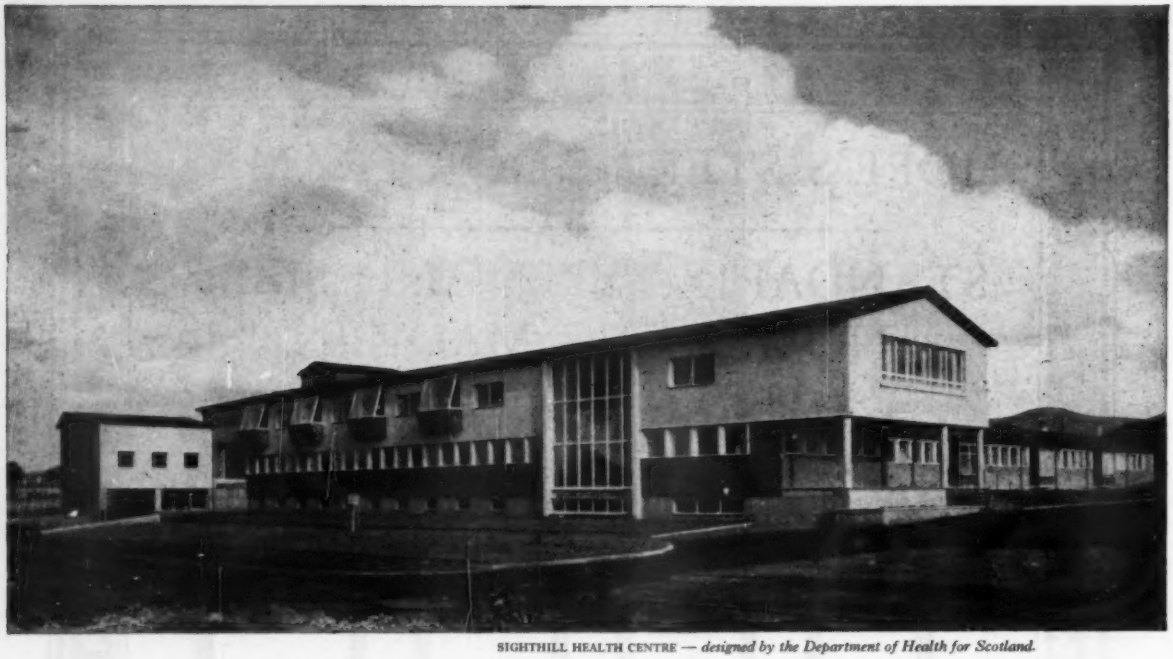


SIGHTHILL HEALTH CENTRE — *designed by the Department of Health for Scotland.*

Electric floor warming at the Sighthill Health Centre

Sighthill was designed as an Experimental Centre under the National Health Service Act. The building forms a hollow square round a central courtyard. The north wing holds administrative departments on the ground floor and dental theatres on the first floor. The south wing houses the joint services departments. The east wing comprises child welfare services and the west wing is divided into six medical suites.

Fully controlled warmth

The building is heated by electric low temperature underfloor radiant heating. This is thermostatically controlled and designed to maintain against an outside temperature of 25°F. the following inside temperatures: surgeries, recovery and X-ray rooms 70°F.; passages and lavatories 60°F.; kitchen 52°F.; other rooms 65°F. Electrical intake is "off peak" and available between 7 p.m. and 7 a.m., and 11 a.m. and 3 p.m.

Loadings

Total loading amounts to 262 kW and is designed for off-peak operation. This load comprises 232 kW embedded in the concrete floors and 30 kW in concealed wall panels. The total floor area of the building is 35,000 sq. ft.

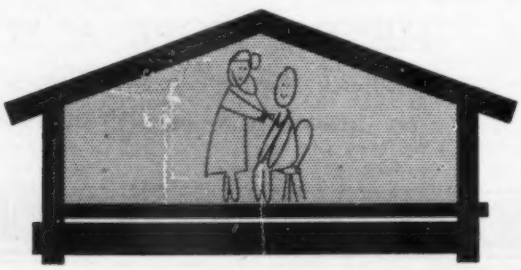
A variety of floor finishes tested

Floor finishes laid were: wood block, cork tile, thermoplastic, mastic asphalt, Caithness stone slabs and terrazzo. All these have given very satisfactory service under heated floor conditions.

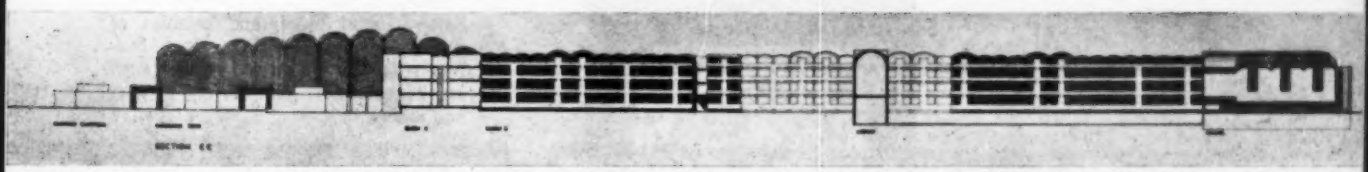
Results

The installation has been running for over five years and the average annual consumption for floor warming purposes is 418,960 units costing £1,400.

Thermograph records were taken during the winter 1955/56. These show that when, in February 1956, the mean daily outside temperature was 22.6°F., the maximum drop in inside temperature during the cut-off period was only 2.6°F. Even under these extreme conditions the internal air temperature did not fall below 60°F.



Issued by the
Electrical Development Association, 2 Savoy Hill,
London, W.C.2. Telephone: TEMple Bar 9434.

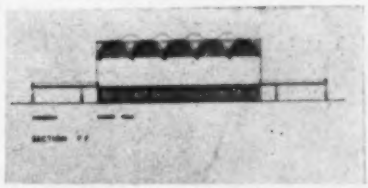


SCHEME BY CHAMBERLIN, POWELL AND BON

Main Analysis	Total Cost	Area ft.s.	Cost ft.s.	Cube cu.ft.	Cost c.ft.
Small Flats ..	80,000	17,920	89/3½	285,410	5/7
Residential Acc.	770,000	166,765	92/4	1,647,505	9/4
Dining facilities & common rooms ..	110,000	13,795	159/5½	424,410	5/2
Chapel (temp.)	8,500	1,500	113/4	31,000	5/6
Libraries ..	34,500	4,146	166/5	101,800	6/9
Administration	26,500	5,927	89/5	82,440	6/5
Guest Accom.	6,500	1,272	102/2½	19,575	6/8
Master's Lodge (inc. garages & servants' flat)..	20,000	3,912	102/3	57,375	6/11½
Tutor's Lodge (inc. garage) ..	12,000	2,458	97/8	36,300	6/7
Porter's Lodge (excl. bell tower)	17,500	4,940	70/10	69,750	5/0
Garages (incl. share of road)	10,000	3,600	55/6½	38,400	5/2½
Totals	1,095,500	226,235		2,793,965	

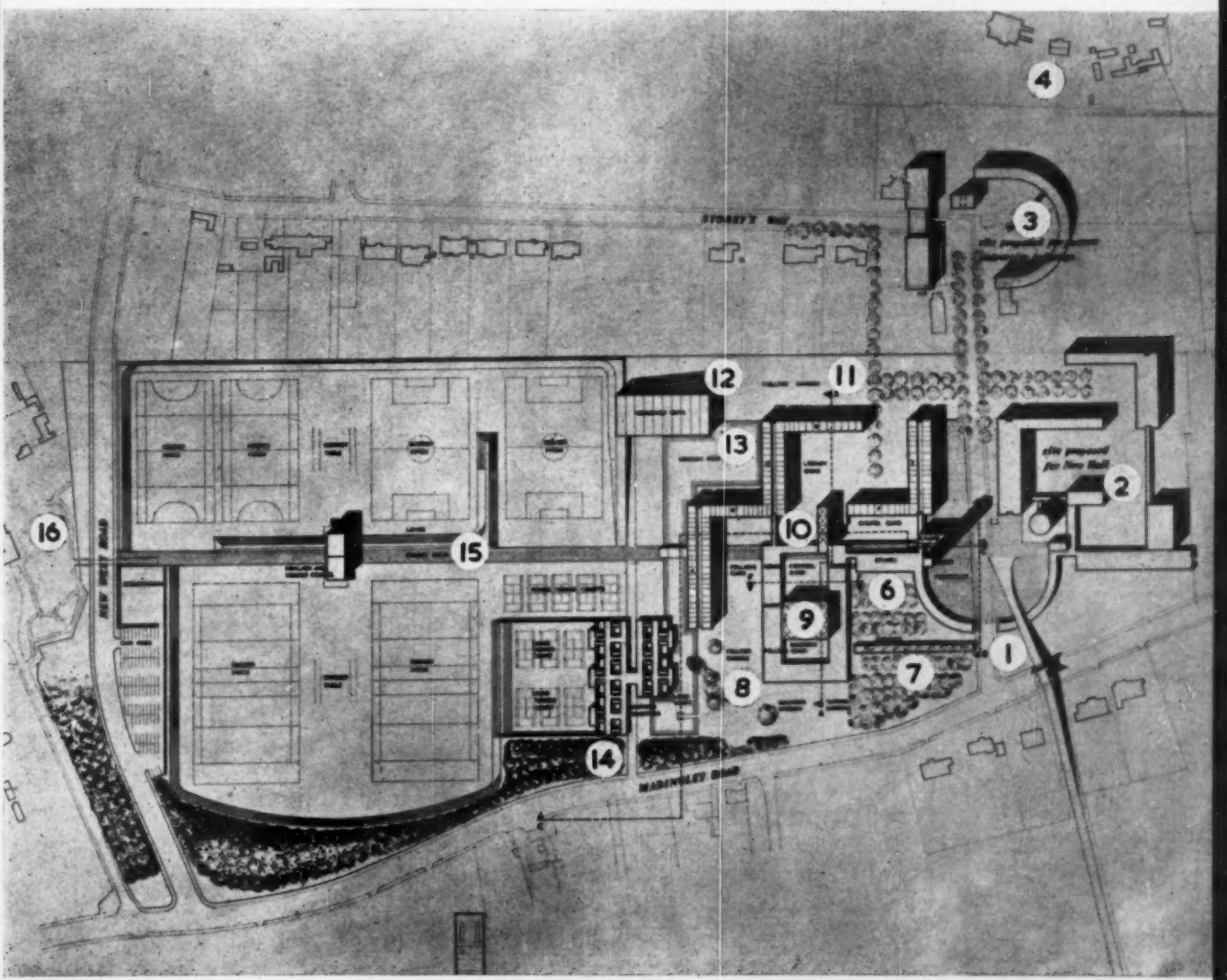
Cost Analysis

Perimeter planting, £7,500. Car parking and cycle facilities, £12,000 Total, £1,115,000.



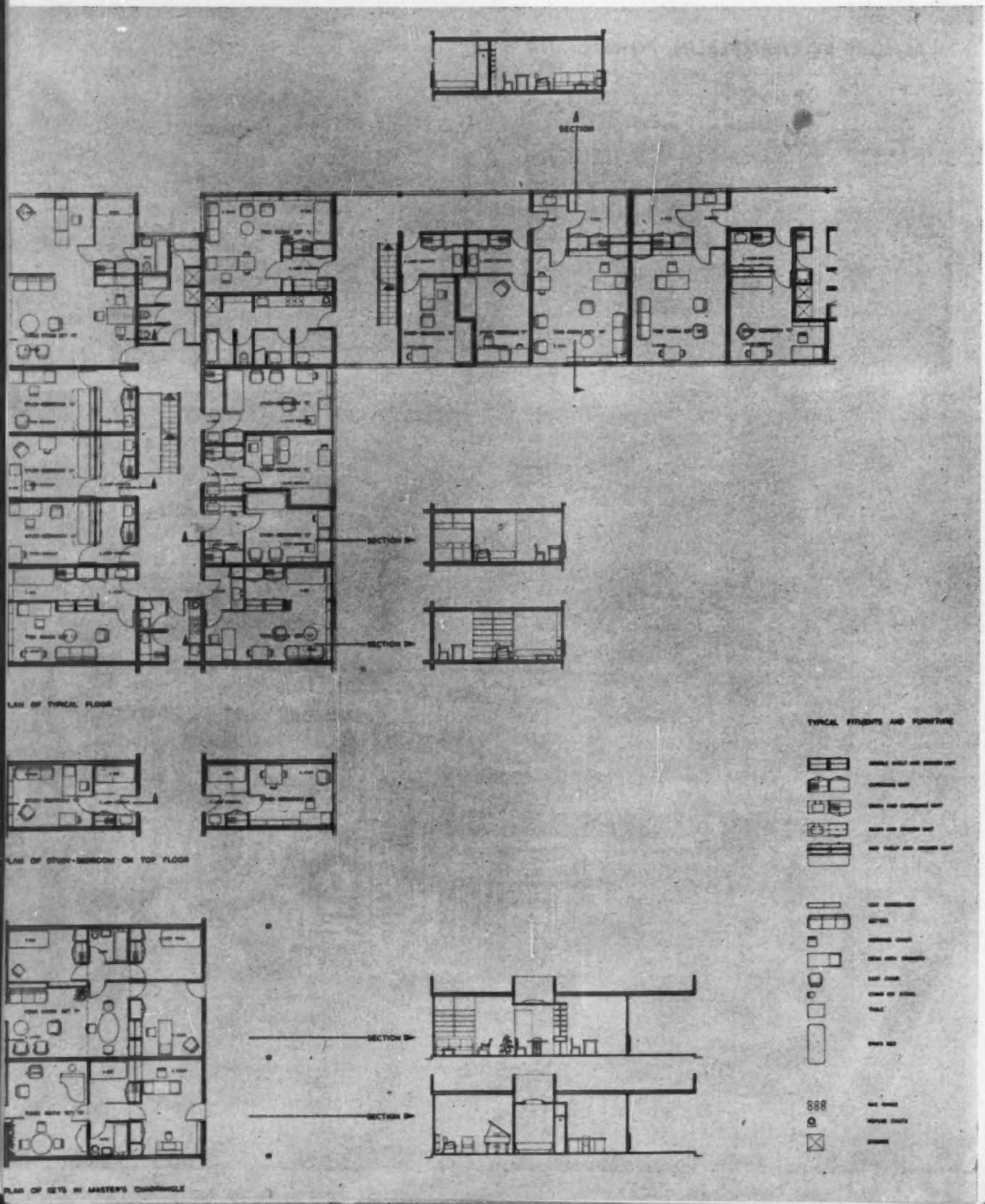
Above, section CC and FF. Below, site plan

KEY: 1. *Entrance.* 2. *Site proposed for New Hall.* 3. *Site proposed for future University lodgings.* 4. *Fitzwilliam House site.* 5. *Chapel.* 6. *Stores.* 7. *Garages.* 8. *Gardens.* 9. *Dining Hall.* 10. *Library.* 11. *College Garden.* 12. *Swimming Bath.* 13. *Skating Rink.* 14. *Married Quarters.* 15. *Broad Walk.* 16. *University Observatory*

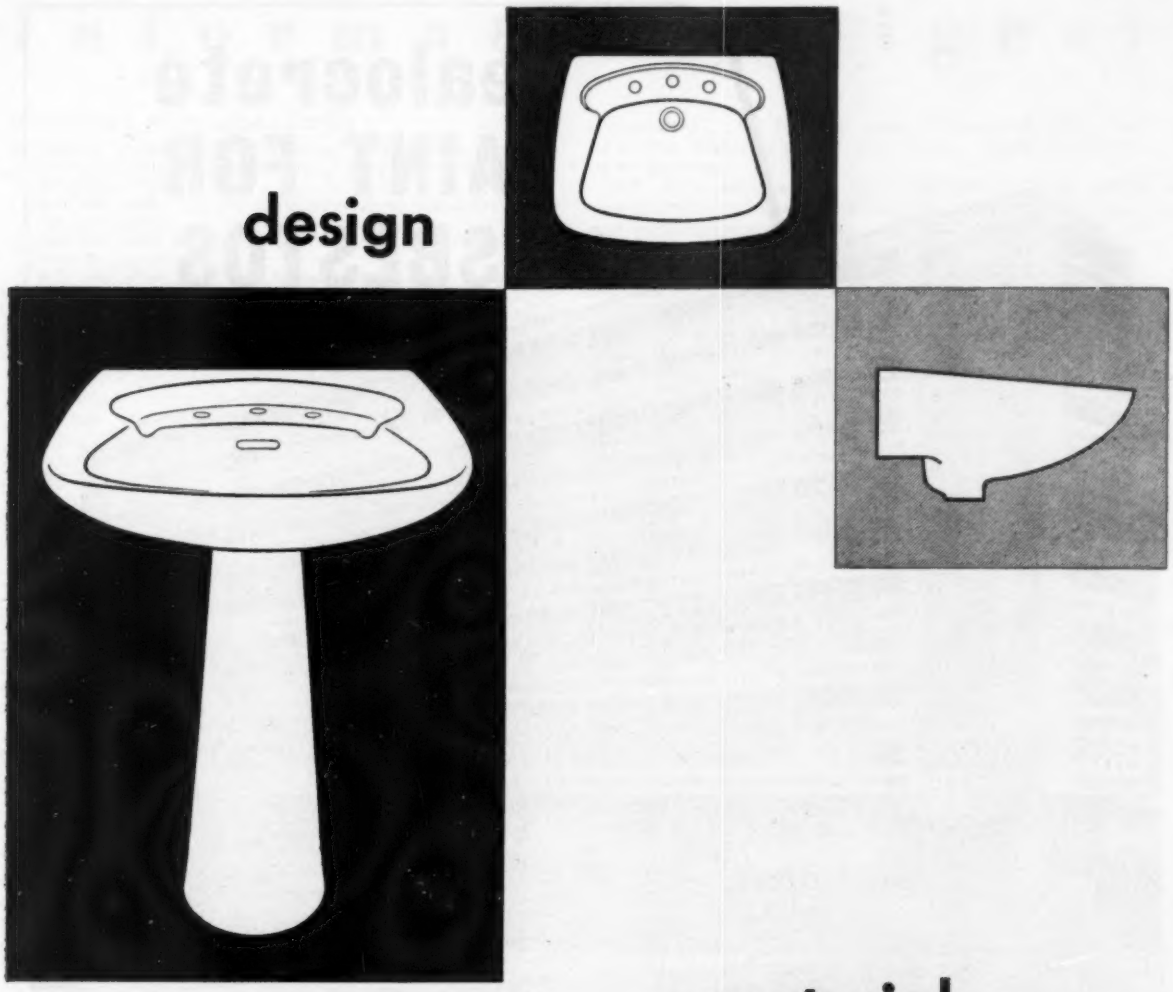


SCHEME BY CHAMBERLIN, POWELL AND BON

Below, detail plans and sections of residential accommodation. Study bedrooms have been planned so that each block contains a full variety of sets and rooms



design



material

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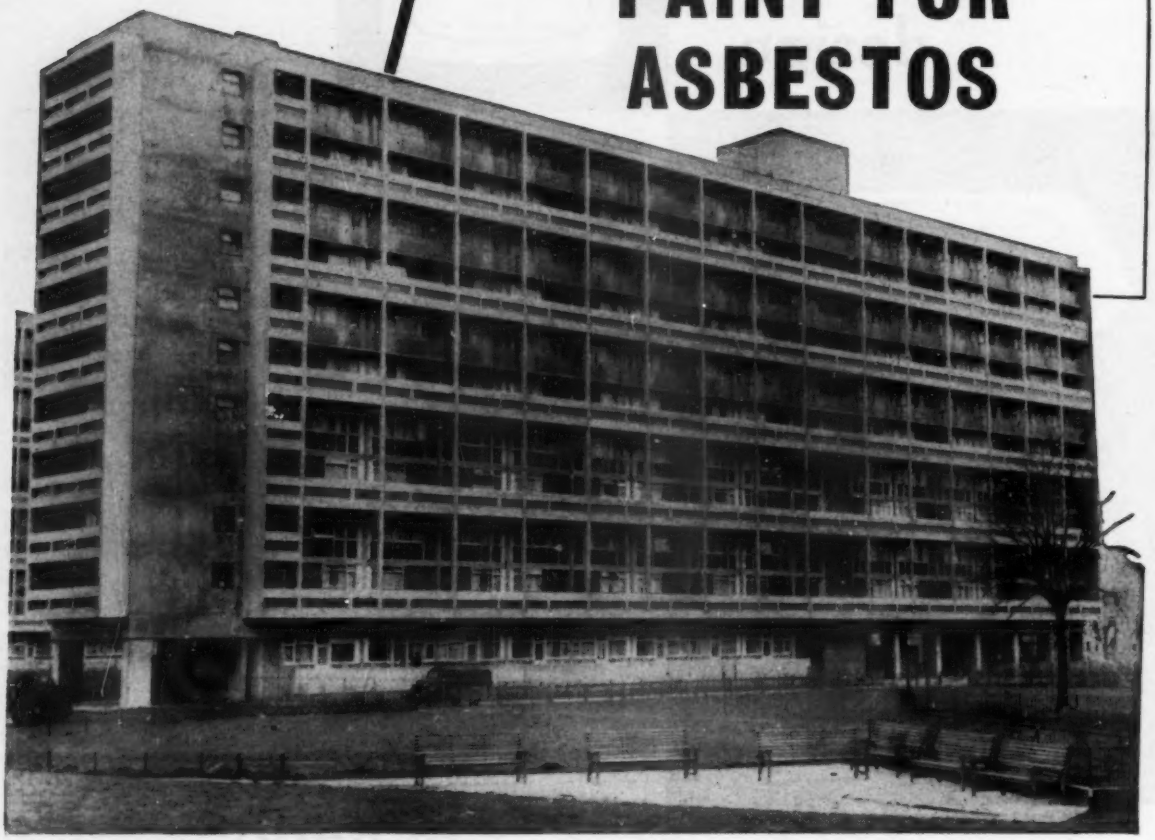

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Information Digest

OFFICIAL PUBLICATIONS

● **British Standard Specifications,** from British Standards Institution, British Standards House, 2 Park Street, London, W.1. Telephone: MAYfair 9000.
B.S. 449: 1959. The Use of Structural Steel in Building. Price 15s, plus postage.
B.S. 1241: 1959. Tarmacadam and Tar Carpets (gravel aggregates). Price 5s, plus postage.
B.S. 3111: 1959. Steel Wire for High Tensile Bolts. Price 4s 6d, plus postage.
B.S. 3116: 1959. Heat Sensitive Detectors for Fire Alarm Systems. Price 4s, plus postage.
B.S.I. News.

B.S. 449 is probably one of the most familiar Standards in use where structural frames are used. Here is a most important new issue which now incorporates Code of Practice C.P. 113 (also a familiar number), but the Standard in its new guise demands study, as there are fundamental changes to be assimilated, although not involving unlearning much in general practice.

Because C.P. 113 duplicated much that was in former issues of B.S. 449 that Code has been abolished but another important Code of Practice, C.P. 3, Chapter 5, on Loading, has also been amended to include requirements for wind-loading on unclad structures which previously appeared in the Standard.

The new issue continues the principles of "simple design" but some of the rules have been modified to permit more economical use of steel in large structures—a feature which results from increases in specified yield stresses in certain thicknesses by a maximum of 5 per cent.

"Semi-rigid" and "fully-rigid" design is still allowed so long as the limiting stresses are not more than those allowed in the Standard. Similarly, "plastic" design continues to be accepted so long as adequate load factors are adopted and deflections under working loads are within the limits set in the Standard. Designs employing the last theory are essentially for specialists.

Another point is that "semi-rigid" designs must, as before, follow the recommendations made in the Steel Structures Research Committee's report in 1936 "Recommendations for design", which has been out of print for some time. The report is now available from B.S.I. under the reference P.D. 3343.

The Standard also now includes data on tubular steel members formerly in P.D. 1736 and tests to be made on welding, though the B.S. relating to the latter remains current (B.S. 2645).

Finally, a supplement is being prepared which will deal with cold rolled sections in light gauge steel and strip steel. As the result of the issue of this revision to B.S. 449, the Codes of Practice C.P. 113:1948 (Structural Use of Steel), 113, 102:1951 (Arc Welded Construction) and 113, 201:1953 (Structural Use of Steel Tubes) are all cancelled.

B.S. 1241 has its first revision since 1945: it deals with gravel aggregates for tarmacadam and tar carpets. The object in preparing a new issue is to tighten up the specifications generally and as to gradings of 1½in, ¾in and ½in thickness, both in base course and in wearing course. An addition is a specification for a carpet having ¾in base course and ½in wearing course.

Binder contents and viscosities generally rank as too abstruse for the non-specialist to argue about but chemists and engineers will no doubt note that modifications to previous requirements are now made. The advantage of having three mixing temperatures for the three viscosity ranges will be obvious, while the adoption of minimum rolling temperatures would appear to have been overdue.

Recommendations for laying have been amended and are tabulated as to types and thicknesses of construction. An appendix sets out the information to be given to tenderers.

B.S. 3111 is new and sets standards for material for "Steel wire for cold forged high tensile bolts and similar components". Six types of steel are involved, being one of carbon steel and five of alloy steels. There is no limit as to diameter.

B.S. 3116 deals with a very restricted field in which manufacturers may well feel they are better informed than any non-competitor in the very specialized business of manufacturing "Heat sensitive detectors for automatic fire alarm systems in buildings". This B.S. does not regulate the materials to be used, however, but sets "type" tests only. One test is designed to discover the time taken for the detector to act when subjected to rising air temperature, while other tests show whether deterioration in speed of action is likely to occur through corrosion, also whether vibration could cause false alarms, which, in those installations which are wired direct to the Fire Service report room, have caused annoyance and cast doubts on the reliability of the equipment. Air velocities and location of detector in rooms have both been considered. The B.S. tests are not to be applied to individual detectors.

B.S.I. News, circulated to members monthly, contains in the June issue the usual wide variety of topics which include flame-proof motors, uses of rubber, international news on Standards matters and an article on Standards and Variety Reduction Applied in Practice. The latter is an extract from a paper by Mr. J. T. Joyce, of Joseph Lucas (Electrical) Ltd., which concerned the motor-car industry. He referred to the very large variety of components which that industry requires today. A similar examination of the ironmongery trade and fibre building board industry could be illuminating. Circulated with this monthly was a press announcement headed "Coping in the Kitchen—B.S.I. to tackle a down-to-earth problem". A conference was held, attended by 60 "experts in all aspects of kitcencraft", to see how modern kitchens could be made to accommodate the equipment now on sale. It is not explained what constitutes an expert but they did agree on two points, one being that there is no co-ordination of size and the other being that kitchens are badly planned. They concluded that faulty placing of windows and doors made the incorporation of more equipment impossible. It is presumed the experts realised that kitchens have to fit in with the rest of the house so cannot be planned like detached boxes. Two decisions were reached, being (a) to recommend to industry co-ordinated sizes of domestic appliance equipment and (b) to set down "Principles of planning" in relation to the modern kitchen. After all the competitions on kitchen design that have been held since the war, the innumerable papers that have been read and the generous and gratuitous advice that has been given by so many interested manufacturers in the last decade can we really expect the experts to tell us anything new? It was suggested by the experts that sizes should "incorporate a module". If this is more than about ¼in it would appear that some equipment must be made bigger than hitherto and be rather more difficult to fit into the plan.

● **Building Research in Australia.** Commonwealth Department of Works.

The annual report has come through rather earlier than usual. Its contents show that the departments are continuing vigorously their programmes of investigation into a wide range of subjects.

Acoustics investigation confirms that, in the department's view, Australian audiences are not critical of listening conditions in halls and accept very wide variations. Sound transmission through ducts is now being examined so as to evolve improved absorbents.

On clay products, causes were found accounting for deterioration of tiles in seaside atmospheres, crystallization of salts being responsible. Improved manufacturing methods have overcome this weakness. In curtain walling, the same reason for cracking of coloured glass panels has

Information Digest (continued)

been adduced as the B.R.S., i.e., stresses set up in the glass from partial shading from the sun's rays. Glazing compounds, also, were examined and thiokol-based materials were found to allow necessary movement without resulting in broken weatherseal.

Pre-cast gypsum plaster units for load-bearing walls have been in use in Australia for some years. Investigations are continuing into the strengths of these panels and deflection under prolonged loading.

Trouble in painting through staining was investigated and found to be due to interaction of hydrogen-sulphide in the atmosphere with lead in paint. The percentage of lead now recommended in paint is therefore reduced to 0·004 per cent. This surely reduces the lead content to a negligible amount, but it is not clear whether this percentage is of weight to other solids or of volume.

In reinforced concrete study, pre-hardening cracking was found to be due to differential rates of settlement of concrete particles within the mass around reinforcement or large aggregate. Tubular steel construction is being examined in conjunction with Stewarts & Lloyds (Australia) Pty. Ltd., in connection with local stresses at joints. In view of the new issue of B.S. 449, noticed in this column earlier, it might be doubted when such investigations are really necessary, in that it must be presumed that the points of investigation have already been fully examined in this country.

Thermal studies resulted in the conclusion that concrete floors are cooler in summer than other floors yet are warmer in winter, presumably because they are poor "heat exchangers".

As to timber construction, it seems that certain persons in Australia are benefiting from popular ignorance of the life-cycle of the Lyctus borer. The victims spend money on spraying house frames to prevent infection when in fact spraying is too late and quite useless. The long-horned beetle seems to have commenced its insidious operations in Australia and the Department is taking strong action to prevent the trouble from becoming widespread and a permanent menace. The lumber industry is continuing at high pressure, resulting in ever more remote felling. Efficient factory layout for timber conversion is becoming more important and the Department's facilities include a design service for sawmill layout.

Examination of the uses of cement included plasticizers, among which was Krilium, which is probably best known generally by gardeners as a very expensive growth-encouraging additive to poor soil. No firm recommendations are given. Plastic linings to concrete formwork are being adopted more frequently for high quality fairface work. Resin-coated reinforcing rods had about five times the hold on concrete of uncoated rods, a development also applied to prestressing wires.

Other studies in progress follow lines indicated in previous Reports and paralleled by those in this country.

TRADE ASSOCIATION PUBLICATIONS

● **Weathering of Timber:** A Study of the Behaviour of Timbers Exposed to Atmospheric Conditions. (C/TR/1). The Timber Development Association Ltd., 21 College Hill, London, E.C.4. Telephone: CITy 4771.

This Report had apparently lost its place in the queue, for it was published in February 1957, so pre-dated the Second Report (C/TR/2) on the same subject noticed in this column in the issue of 20.5.59.

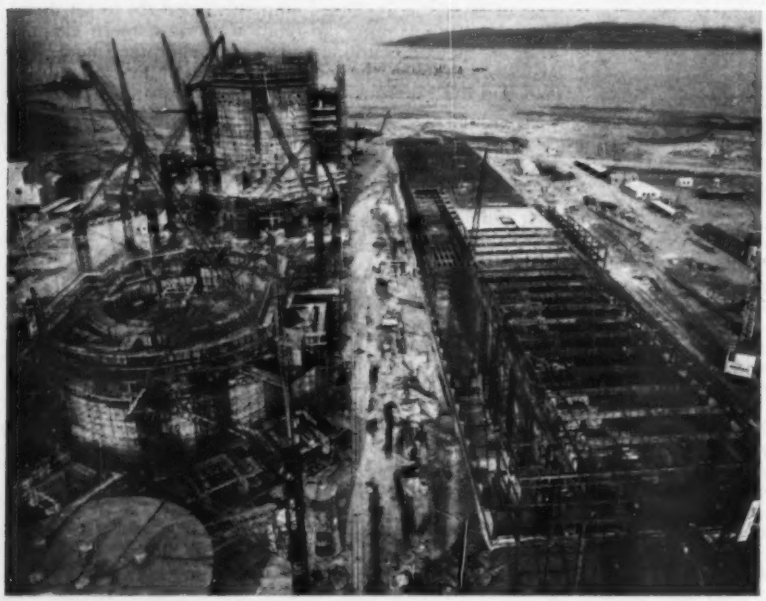
The first Report was inspired by the growing popularity of exposed wood for exteriors and a general wish to keep permanently the rich natural colours of woods. The first Report confirms that all woods, irrespective of species, change colour on exposure if left uncoated. The change is due to ultra-violet light and the mechanical action of rain, snow and windblown particles. The change in colour is not necessarily a surface decay.

In the first tests, two woods only were used, being western red cedar and sapele. Western red cedar held the protective film better than sapele. The films used, applied in accordance with makers' instructions, were phenol formaldehyde, epoxy, urea formaldehyde and alkyd resin-based varnishes applied by brush.

Epoxy and alkyd-resin finishes preserved colour best but not completely. The change in colour is partly due to checking and splitting of the surfaces, which required considerable elasticity in the film to prevent failure.

● **Structural Concrete Buildings.** Cement and Concrete Association, 52 Grosvenor Gardens, London, S.W.1.

A most interesting review of notable work having concrete frames is contained in this booklet. One is reminded, in turning the pages, of many original ideas which have influenced subsequent work. The booklet is in seven sections, all (except the introduction) well illustrated by



A view from the Goliath crane of the central part of Hunterston Nuclear Generating Station. The 640ft long turbine hall is on the right, with the two reactors adjacent to it. The station is being built for the South of Scotland Electricity Board by The General Electric Company Limited

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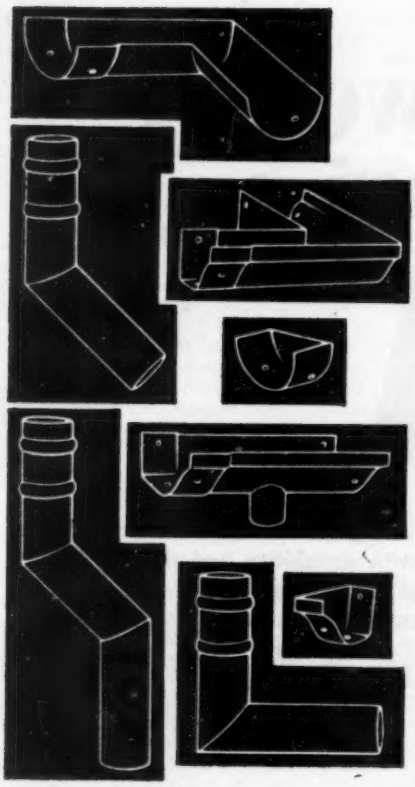

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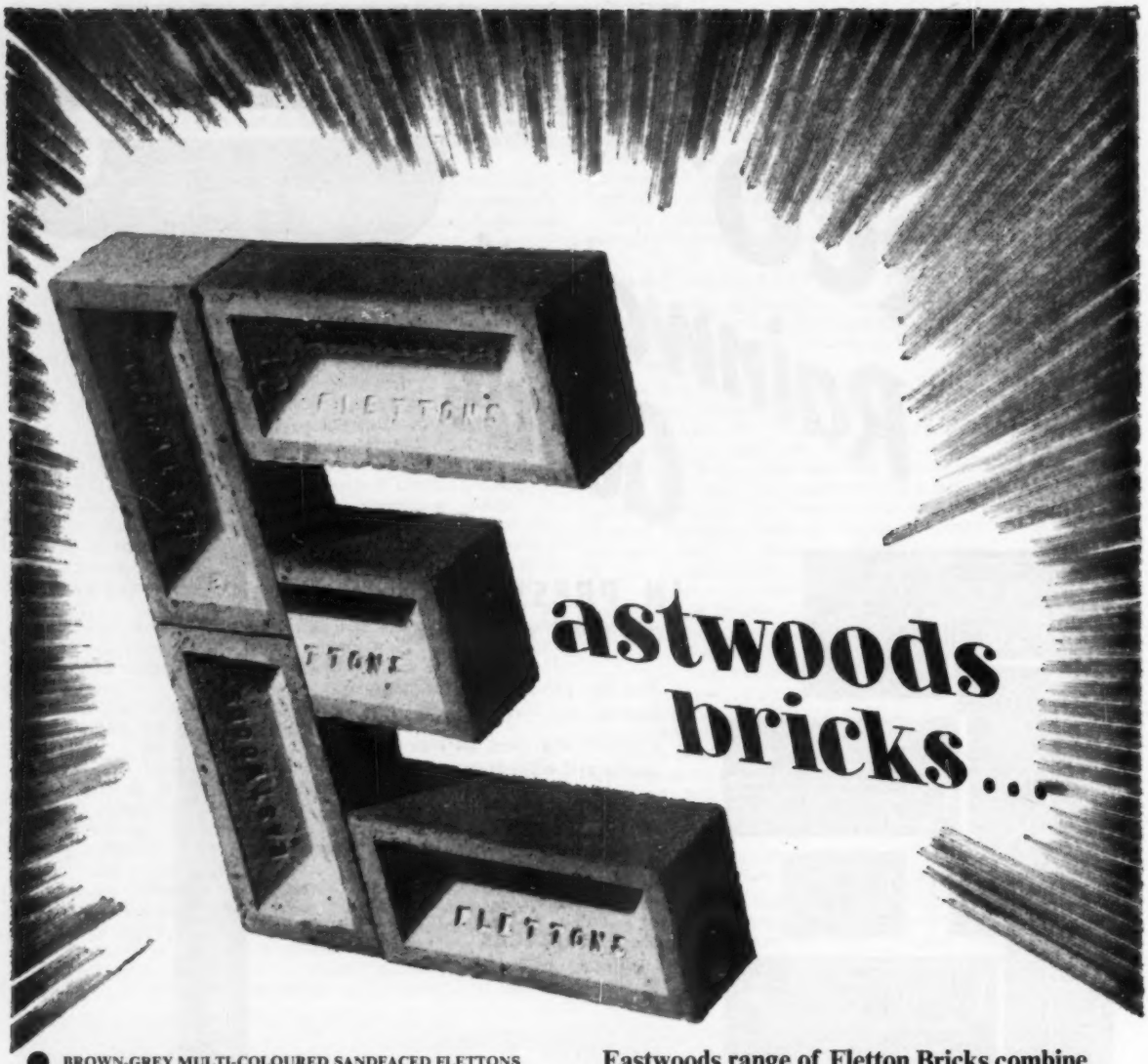

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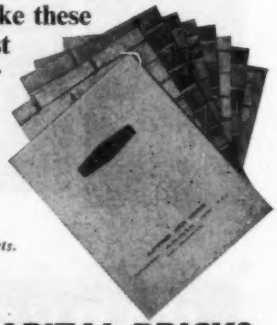

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E.26880

Information Digest (continued)

views of the exteriors of the types of buildings under discussion and all very briefly described but important structural points being emphasized. The types are Flats, Schools and Colleges, Factories, Shops and Offices, Transport, Hospitals and Hotels.

The section on flats deals with well-known schemes including Pimlico, Bishops Bridge Road and the LCC's Ackroydon Estate. In Schools and Colleges, the M.o.E.'s own design for Worthing Secondary Technical School is illustrated and two LCC examples—Strand School, Tulse Hill, and Elliott School, Putney, both firm and characterful designs yet poles apart in conception. Of the factories illustrated, Brynmawr is again reproduced, also the very interesting building with V-section arch frames for Matthews and Mumby and that *tour-de-force*, the Bank of England Printing Works. Shops and Offices include David Greig Ltd., Canterbury, Dunn's, Bromley, and the T.U.C. building. Transport shows the two admirable bus garages—Bournemouth and Stockwell, having vaults spanning 150ft and 194ft respectively, and the distinctive Renfrew Terminal Buildings. Hospitals and Hotels are less striking, though "The Dover Stage Coach" is a spirited design to brighten this section.

The introduction gives arguments in favour of the use of concrete structural frames as opposed to other forms of construction. Beamless floor slabs for office buildings, prestressing of parts and box frame construction make for cheapness but C. N. Craig, A.R.I.B.A., of the B.R.S., reported in a paper at the 1957 Health Congress that for four-storied flats, brickwork cross-walls were cheaper than concrete at the present time but foresaw a time when it should be possible to pre-cast concrete walls, so bringing the cost down enough to compete with brickwork in lower buildings. "No-fines" concrete load-bearing structures had been used successfully and within required cost limitations—under 53s per square foot—up to 10 storeys high. He believed, however, that a dense concrete construction had considerable merits. The M.o.W. are reported to have effected a saving of about £150,000 on the second stage of Whitehall Gardens by using concrete frames instead of steelwork. The M.o.W. view is that, generally, the saving may amount to 20 per cent, against the cost of the steel framed concrete-cased building.

● **Application of Mastic Asphalte.** The Natural Asphalte Mine-Owners and Manufacturers Council, 94-98 Petty France, London, S.W.1. Telephone: ABBey 1010.

Another edition of this work is now available. It gives recommended specifications for Roofing, Tanking and Damp-proof Coursing and Flooring. It covers the same ground as the pocket handbook for clerks of works noticed in this column in the issue of 18.3.59 but is bulkier and more sumptuous so as to appeal to the architect, whose shelves must be at least 12in apart to receive it. The illustrations are very clear and informative and include the recommended ventilators to organic roof insulation which was previously the subject of a separate leaflet. These should be of great assistance to draughtsmen, for arrangements to finish to eaves, verges, R.W. outlets etc., are often not readily understood. Some of the details could be—and probably are—simplified. Why, for instance, is it necessary to have a lead drip under a metal sill and extended to master the asphalt skirting top edge when, alternatively, the asphalt skirting could be brought up and tucked under the metal sill where it would be fully weathered? A similar query is raised where a concrete roof light caps a concrete kerb: it would appear to be obvious to bring up the asphalt and tuck it into the groove provided in the roof light soffit, a normal throating being shown in addition. These queries arise from the illustrations on pages 21 and 32.

One point on asphalt flooring may be quoted. This refers to the need to maintain warmth in a building while laying such flooring, otherwise chilling may occur in cold weather, resulting in contraction and open joints.

TRADE PUBLICATIONS

● **The Geon Story.** Everyman's Guide to PVC Plastics. British Geon Limited, Devonshire House, Piccadilly, London, W.1.

Geon is manufactured at Barry, Glamorgan, the makers being a subsidiary of the Distillers Plastic Group. It is made in a number of forms, the flexible group including PVC sheeting, PVC leathercloth, oilskins, gloves, garden hose and covered wire and cable. In the rigid form there is sheet, pipe, tubing or rod and compression moulding of panels. It is also available in cellular form for cushioning and thermal insulation. Materials of interest to the building trade include PVC floor and wall tiles, handrails, coated fabrics, leathercloth, cushions, thermal insulation and absorption and electricity insulation. Many of the products are for manufacturers' use including the chemicals industry. There is little technical information in the brochure as it is mainly intended to indicate the extensive possibilities of the material.

● **Building Board Directory, 1959.** The Middlesex Publishing Co. Ltd., 194-200 Bishopsgate, London, E.C.2. Price 4s post free.

The materials included are Hardboards, Fibre Insulation Boards, Laminated Boards, Acoustic Tiles, Wood Chipboards, Compressed Flax Boards, Plastic Laminated Sheets, Plastic Faced Boards, Decorated Boards, Compressed Straw Slab, Woodwool Slab, Plaster Boards and Asbestos Sheets. There is an alphabetical Index of Boards, a Register of Boards, list of Importers and Stockists, Conversion Tables, Metal Fixers and statistics of production and import. In the Register, the brand name is given, the type such as Acoustic Tile or Hardboard, standard sizes, thicknesses, weight, producer and agent or concessionnaire. Division of the Register into nine sections, being (1) Hardboards, Fibreboards etc., (2) Wood Chipboard, Compressed Flax etc., (3) Plastic Laminated Sheets, (4) Plastic Faced Boards, (5) Decorated Boards, (6) Compressed Straw Slabs, (7) Woodwool Slabs, (8) Plaster Boards and (9) Asbestos Sheets and Asbestos Based Boards, enables suitable materials to be found by classification where the name is not known.

● **Building Boards Price List.** C. F. Anderson & Son Ltd., Harris Wharf, Graham Street, London, W.1.

Another handy publication gives prospective purchasers the opportunity to compare prices. Here, too, sizes and thicknesses are given, together with brand name and description. The list is in seven groups, comprising (1) Fibre Building Boards, (2) Asbestos Boards, (3) Plaster, straw and woodwool slabs, (4) Constructional Laminated Plastics, (5) Decorative, Decorated and Veneered Boards, (6) Chipboards and in (7) Wallboard Accessories and Ancillaries, being cover strips, beads etc., and suitable adhesives.

● **Metsec Wood-filled Intermediate Joists.** Metal Sections Ltd., Oldbury, Birmingham.

These "nailable" cold-rolled open framed joists are well known and this brochure should be useful as it gives load tables for clear spans from 20ft to 60ft. There are two bracing systems, heavy and light. The latter show most advantage in the short spans. Design details are illustrated as are joist and stanchion connections for two-storey buildings. Beams are available with eaves extensions of the top blooms and firring timbers can be provided if required.

In addition to beams, there are available both cold-rolled and hot-rolled box stanchions. Area of metal in a 4in by 4in cold-rolled stanchion is 1·94 sq in, while the hot-rolled version has 4·18 sq in but at 10ft height the former can carry axially 9·54 tons while the hot-rolled stanchion can receive 21·48 tons. Seams are welded.

NEW PRODUCTS

In this feature are reviewed new lines introduced to the building industry for the first time and additions or improvements to existing ones. Any advantages claimed for a product are from information supplied by the manufacturer

Standard Flat Roof Building (A)

This structural engineering company has designed a standard steel-framed construction for a flat roof or a monitor roof building of single- or double-storey height. It is claimed that the utmost economy has been achieved in this form of construction by the use of the Plastic Theory at the design stage, by the use of universal beams, and by simplicity of design of all structural members. Standard site connection details have also been prepared for any particular steel section. Complete flexibility in planning is also claimed for this type of building since any module, eaves height, superimposed loading and wind loading can be specified, while retaining all the advantages and economies associated with other standard forms of construction. Basically, the span of the building is built up of one or more central units of any chosen dimension and a proportional end unit at each side. These end units are designed as 0·85 width of the chosen dimension in order to allow a constant depth of main beam to be maintained throughout the complete width of the building, and a simple connection to be used at the extremities. If desired, however, all units can be made dimensionally equal by the use of a moment connection at the extreme ends. The main frames can be at any required centres to provide a building of any given length. Any form of roof and side-wall cladding can be used with this steel framework. It is further claimed that the versatility and flexibility afforded by the free choice of dimensions enables small or large factories or offices to be designed with the minimum interference from internal columns and allows greater freedom in the planning of internal layout.

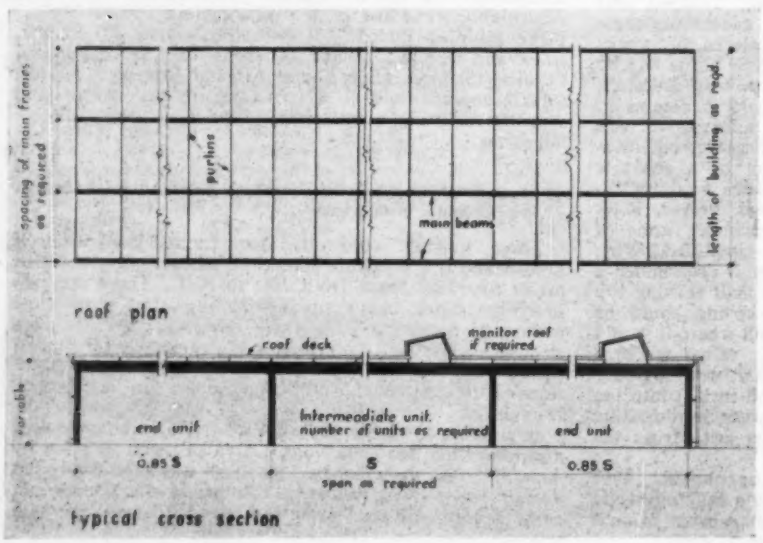
Sanders & Forster Ltd., 3 Buckingham Palace Gardens, London, S.W.1.

Readers' Information Service, Ref. A. Date 19/8/59.

★

New Asbestos Cement Fixings and Jointing (B)

Three new developments have recently taken place which should contribute to the efficiency, speed of fixing and appearance of Universal asbestos cement products. The first of these is the Selanut for use with Universal sheetings. It is a steel nut embedded integrally in an alkathene roofing washer and is designed to replace the nut, Uniseal washer and galvanized metal washer previously used with the hook bolt. It is claimed that tensile tests with an applied pull of 1,000lb failed to drag the steel nut through the plastic, giving a substantial strength margin over the hook of the hook bolt. The Selanut is stated to provide an efficient watertight fixing with non-corrosive properties. The suppliers of the alkathene believe that the use of carbon black as a filler gives the longest weathering life, but other colours can be supplied. Selanuts with 6½in hook bolts cost 40s 1d per 100. The second new product is the Selawasher for use with roofing bolts and clips. It does away with the need for a separate Uniseal or felt washer and a galvanized metal washer. The Selawasher is a simple alkathene moulding made in the form of a circular cup. It is strong enough to provide a firm seating for the nut and yet is sufficiently soft to deform under pressure to the contour of any asbestos cement sheet profile. Standard colour is black but, as with the Selanut, other colours can be supplied. Price: 4s 6d per 100. The third development is an expanded butyl strip material, known as Universal Foamjoint, which has been introduced to provide a simple, quick and foolproof method of sealing the joints in asbestos cement industrial gutters. Advantages claimed are that its use eliminates the making of joints with tarred hemp gaskets and mastic, and that it overcomes the need for costly repairs resulting from joint failure. Foamjoint should simply be pressed into the socket end of the gutter and the spigot of the next gutter section brought into position and seated firmly by hand. Dry adhesive on the Foamjoint reacts with the special priming on the gutter ends to establish an immediate bond. The free ends of the Foamjoint should be trimmed, and the works-drilled spigot end used as a template for drilling through the jointing strip and the socket beneath. The joint should then be secured with 5/16in mushroom-headed galvanized bolts with Selawashers on the topside and Selanuts on the underside, tightened slightly to compress the Foamjoint. The prepared strips of Foamjoint are boxed in sizes suitable for use with box, boundary wall, northlight and valley gutters. The



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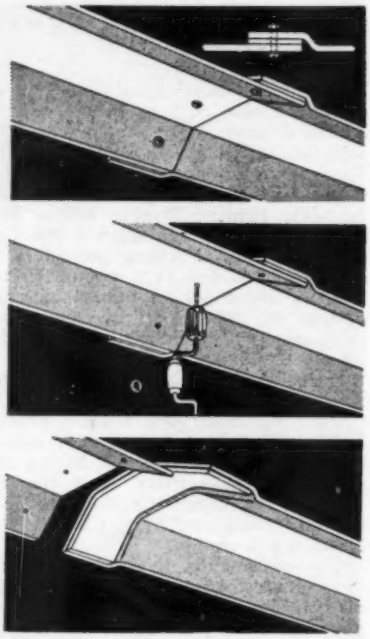

B

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NEW PRODUCTS (continued)

bearing surfaces are reduced to 3in instead of the usual 6in socket, and three fixing holes are drilled in line across the gutter instead of the normal staggered bolting arrangement.

Universal Asbestos Manufacturing Co. Ltd., Tolpits, Watford, Herts. Watford 34551.

Readers' Information Service, Ref. B. Date 19/8/59.

★

New Slab Urinal (C)

A new slab urinal, known as the Vitural, is the latest addition to the Standard range of sanitary appliances. The product is made entirely of non-porous vitreous china. It is available in three basic forms: (1) slabs 18in wide plus dividers, total width per stall of 24in; (2) slabs 15in wide plus dividers, total width per stall of 21in; (3) slabs 18in wide with no dividers, total width per stall of 18in. In form (3), the urinal has a continuous surface, each slab of china having a slightly concave shape. End screens are either free-standing or designed for fitting against or into an end wall. Floor channels and high level cisterns are also of vitreous china. The range of cisterns is from one to six gallons. Illustration is of a urinal consisting of four 15in slabs and no dividers. The left-hand end screen is free-standing and the right-hand one is the type that fits against an end wall.

Ideal Boilers & Radiators Ltd., Ideal House, Great Marlborough Street, London, W.1. Gerrard 8686.

Readers' Information Service, Ref. C. Date 19/8/59.

★

Mobile Air Compressor (D)

This company is now offering an air-cooled version of the Jenbach diesel-driven mobile air compressor. The machine has a capacity of 78 cu ft/min at 100 p.s.i., and the prime mover and compressor form one unit. The single-cylinder engine, with turbulence chamber, works on the four-stroke cycle and its power is transmitted directly from the crankshaft to the compressor piston by means of an aircraft-type secondary connecting rod linked to the main connecting rod. The engine and compressor cylinders form a 90 deg angle and heavy fly-wheels on both sides provide even runnning. Electrical starting equipment consists of starter motor, dynamo and battery. Engine and compressor are cooled by a single high-efficiency blower, and there is a special fan for the compressed air cooler. The 3½ cu ft air receiver is mounted on a frame and has two ¼in air hose connections. Pressure gauge, safety valve and automatic condensation water drain valve are fitted. Pressure regulation is automatic by means of a regulator valve in the induction pipe of the compressor operated by a pressure dependent cut-out governor. The fuel tank holds 5½ gall.

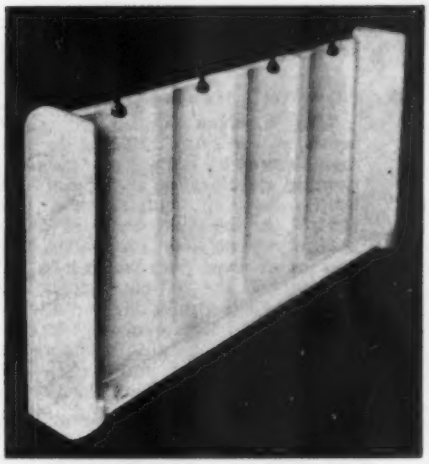
Chamberlain Plant Ltd., Crown Works, Southbury Road, Enfield, Middlesex.

Readers' Information Service, Ref. D. Date 19/8/59.

★

Combined Stairtread-Nosing-Riser

A complete covering of resilient vinyl for the treads of stairs, united with a dust-excluding cove and the risers, is the latest addition to the Marley range. The covering is made in two types, one with a bull-nose for fitting on conventional bull-nosed wooden staircases, and the other with an angled nose for fixing to concrete steps and other stairs that do not have a bull-nose. It is considered suitable for domestic use as well as in hospitals, schools, offices and factories and is produced in grey, green, red, white and black. Extra decorative effect can be achieved by using a riser of contrasting colour to the tread. The staircovering is fixed piece by piece, first the tread, which incorporates a non-slip nosing, is fixed by adhesion, and then the riser is fitted so that the cove overlaps the join. The next tread upwards is fixed so that the nosing overlaps the top of the riser, and so on. Marley Stairtread is available on a supply only basis or else it can be supplied and fixed by the Marley Organization. It is made in lengths of 9ft, the tread being 14in wide and the riser 7½in high. Recommended adhesive: Marley M.8.



C

The Marley Tile Co. Ltd., Sevenoaks, Kent. Sevenoaks 55255.

Readers' Information Service, Ref. E. Date 19/8/59.

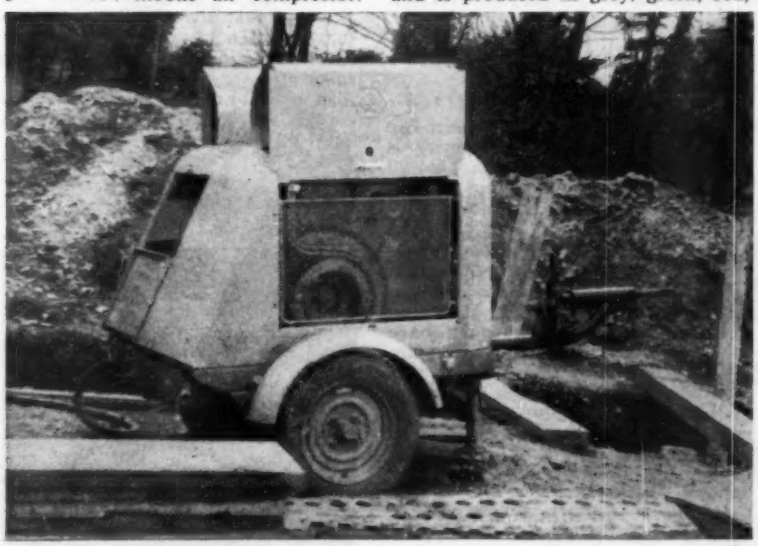
★

Tool Sharpening Machine

The new Viceroy Junior Sharpedge 10in edge-tool sharpening machine is a smaller version of the Viceroy Sharpedge 16in model. It is designed for less exacting requirements than the larger machine and is really only suitable for the sharpening of plane irons and chisels. It can be mounted on a bench and used in small establishments and workshops to replace hand or motorized sandstones. The machine is contained in a 14G metal cabinet and is powered by a ¼ h.p. electric motor developing 1,425 r.p.m. The sharpening wheel, size 10in by 1¼in, is situated on top of the cabinet. The rest of the standard equipment comprises a simple rest, overload release starter, gravity feed and tanks for cutting oil, and a wheel wrench. Overall dimensions: 15in by 20in by 12in. Price (including standard equipment: £48 10s. Pedestal mounting and cabinet base are extras.

Denford Small Tools (Brighouse) Ltd., Victoria Works, Birds Royd, Brighouse, Yorks. Brighouse 2264.

Readers' Information Service, Ref. F. Date 19/8/59.



D

NEW PRODUCTS (continued)

New Oil Heater (G)

The Welcome radiant convector heater is the latest addition to this manufacturer's range of paraffin-burning space-heating appliances. The heater has an output of 8,000 B.Th.U./hr on full fire and 5,000 B.Th.U./hr on low fire. The full tank holds seven pints which lasts for 14 hours at the full-on rate and 22 hours in the low position. An adjustable control valve regulates the output. The oil in the fuel tank is filtered as it flows into a non-spill reservoir, before reaching the burner trough. The reflector and fascia

G

panel are chromium plated, the latter being mounted in a stove-enamelled steel case finished in old-gold paint. The dress guard conforms to B.S. 1945 and the case is insulated so that it stays cool when the heater is working. The Welcome stands on four adjustable feet and there is a specially balanced and insulated carrying handle. Price: 10gn (including P.T.).

*Turley & Williams Ltd., 74 Borough High Street, London, S.E.*1. *Hop.* 3991.

Readers' Information Service, Ref. G. Date 19/8/59

★

Miniature Calculating Device (H)

The Multor circular calculating device that can be held in the palm of the hand, has been modified. New features of the Multor Series II include a reciprocal scale for quick multiplication and division, and three dials instead of two on the previous model. By turning the dials, calculations are carried out automatically, including, for example, currency conversions and the number of miles a car does to a gallon of petrol. Graduations are provided for the calculation of squares, roots and cubes. The calculator is supplied in a strong plastic case and costs 37s 6d.

*K. Bisset & Co. Ltd., 145 Grand Buildings, Trafalgar Square, London, W.C.*2. *Trafalgar* 4177.

Readers' Information Service, Ref. H. Date 19/8/59.

H

★

Grooved Lightweight Concrete Blocks (1)

The Building Research Station has now developed a lightweight concrete block which is provided with seven grooves on each face, designed to allow easy cutting with clean arrises, and spaced to give accurate sizes ranging upwards from 3in at 1½in intervals. With the conventional 18in by 9in block, cutting and fitting at openings and quoins leads to much waste of time and material. Several operations are involved in measuring, marking, cutting and trimming a block to the required size, and the off-cut is rarely usable. Trials with the new block are claimed to have shown that these four operations are reduced to one, that both cut portions are usable, and there is little waste or debris. On the manufacturing side, the block calls for only minor adaptation of existing mould boxes—the insertion of appropriately shaped liners or mould plates, or the fitting of fillets to give the shape and size of groove required. On some machines, pallets and heads may need to be notched.

Building Research Station, Garston, Watford, Herts. Garston 2246.

Readers' Information Service, Ref. I. Date 19/8/59.

★

1 cu yd Dumper Modified

The latest addition to the Muir-Hill range of earthmoving machinery is a modified version of the 3S 1 cu yd dumper in which the lay-out of controls has been improved to provide greater simplicity and ease of operation. Clutch and brake pedals are of a curved lever design and require less effort to operate than the conventional straight lever types. Both foot controls and the hand brake have been positioned to provide maximum leg comfort. The improved dumper has an all-welded chassis which imparts increased rigidity. Heaped body capacity is 30 cu ft.

E. Boydell & Co. Ltd., Elsinore Road, Old Trafford, Manchester, 16. *Trafford Park* 1641.

Readers' Information Service, Ref. J. Date 19/8/59.

I

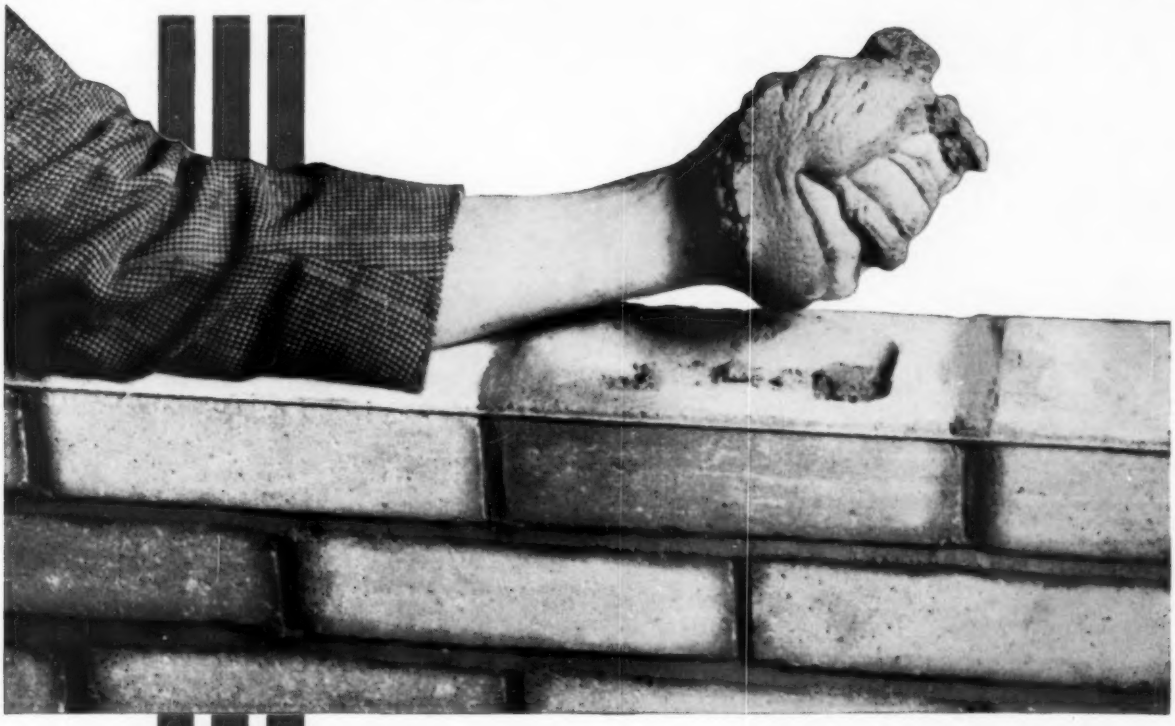
Portable Electric Fire (K)

This company has developed a portable electric reflector fire which is designed to reach its heating temperature quickly and, by throwing the heat well forward, to make the most efficient use of the electricity consumed. Two sizes of Superglo fire are made, 1kW and 2kW, and in both models special rod-type elements are used. The element rods measure 12in long by ¼in dia. and are wound with 80/20 nickel chrome wire. End-cap connection is by a special welding which bonds the wire directly to the patented end-cap. The element attains a just-visible red glow in 22 seconds and reaches maximum temperature in 1 minute 56 seconds, both times being claimed as records by the manufacturers. Contact blades are fully shrouded in ceramic pressings so that they cannot earth inadvertently to the metal of the reflector, and the wiring is easily accessible, although it is enclosed. The parabolic brass reflector, nickel and chrome plated, is polished to a mirror finish for maximum forward reflection. To reduce discolouration with age and to allow free movement of warm air upwards, the top of the reflector is foreshortened, whilst the lower half is extended so that the floor temperature does not exceed B.S. limits. The Superglo fire is available in silver grey, mushroom, golden bronze, lilac, red and Cresta blue. Prices (including P. Tax): 1kW (Cat. 6610), 3gn; 2kW (Cat. 6620), 4gn.

*A.E.I.—Hotpoint Ltd., 33 Grosvenor Place, London, S.W.*1.

Readers' Information Service, Ref. K. Date 19/8/59.

K



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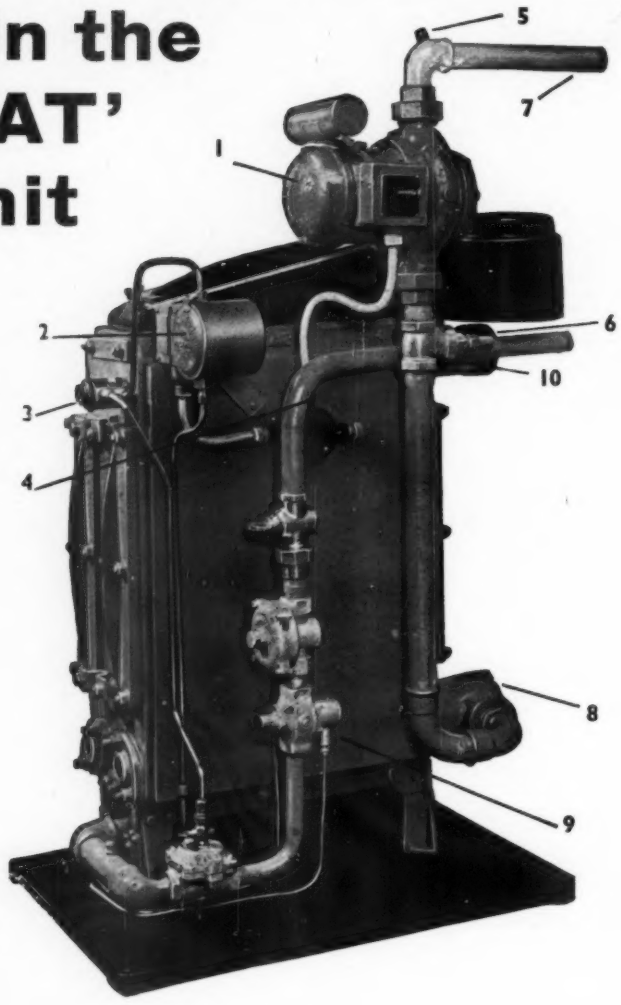
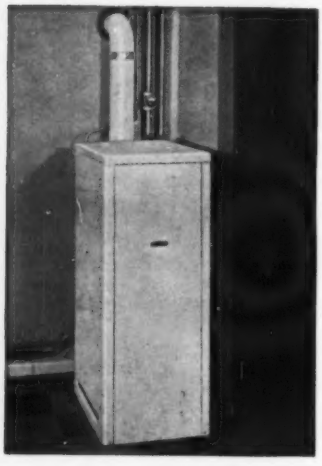
F

What's what in the new 'DIPLOMAT' Small Bore Unit



1. **Sigmund THERMOPAK accelerator pump.**
2. **HORSTMANN clock controller incorporating 5 amp. switch.**
3. **Thermostat.**
4. **Unit pre-wired in flexible conduit to junction box.**
5. **Air vent.**
6. **2 x 1¼ B.S.P. flow tappings.**
7. **Central heating return connection 1 in. B.S.P.**
8. **Additional return connection (gravity circuit).**
9. **Thermo/electric flame safety device.**
10. **Lock shield valve.**



LEFT : *The totally enclosed 'Diplomat' Small Bore Unit in a kitchen setting.*

New 'Diplomat' 30, 44 and 66 Gas-fired Small Bore Units have *all* their works inside *one* good-looking case. Like all 'Diplomat' Gas-fired Boilers, all servicing and maintenance can be carried out from the front. Installation is straightforward as they are conceived and designed for easy fixing. Electrical connections between the time switch and accelerator are pre-wired to cut down installation work. A 'Diplomat' 100 Small Bore Unit is also available as a packaged unit but with accelerator mounted behind the casing.

LIST PRICES

30,000 B.t.u/hr : £90. 0. 0.	**44,000 B.t.u/hr : £100. 0. 0.**
66,000 B.t.u/hr : £116. 0. 0.	**100,000 B.t.u/hr : £136. 0. 0.**

'DIPLOMAT' Small Bore Units

models of self-control

'Diplomat' is a registered trade name

THOMAS POTTERTON LIMITED, 20/30 Buckhold Road, London S.W.18.
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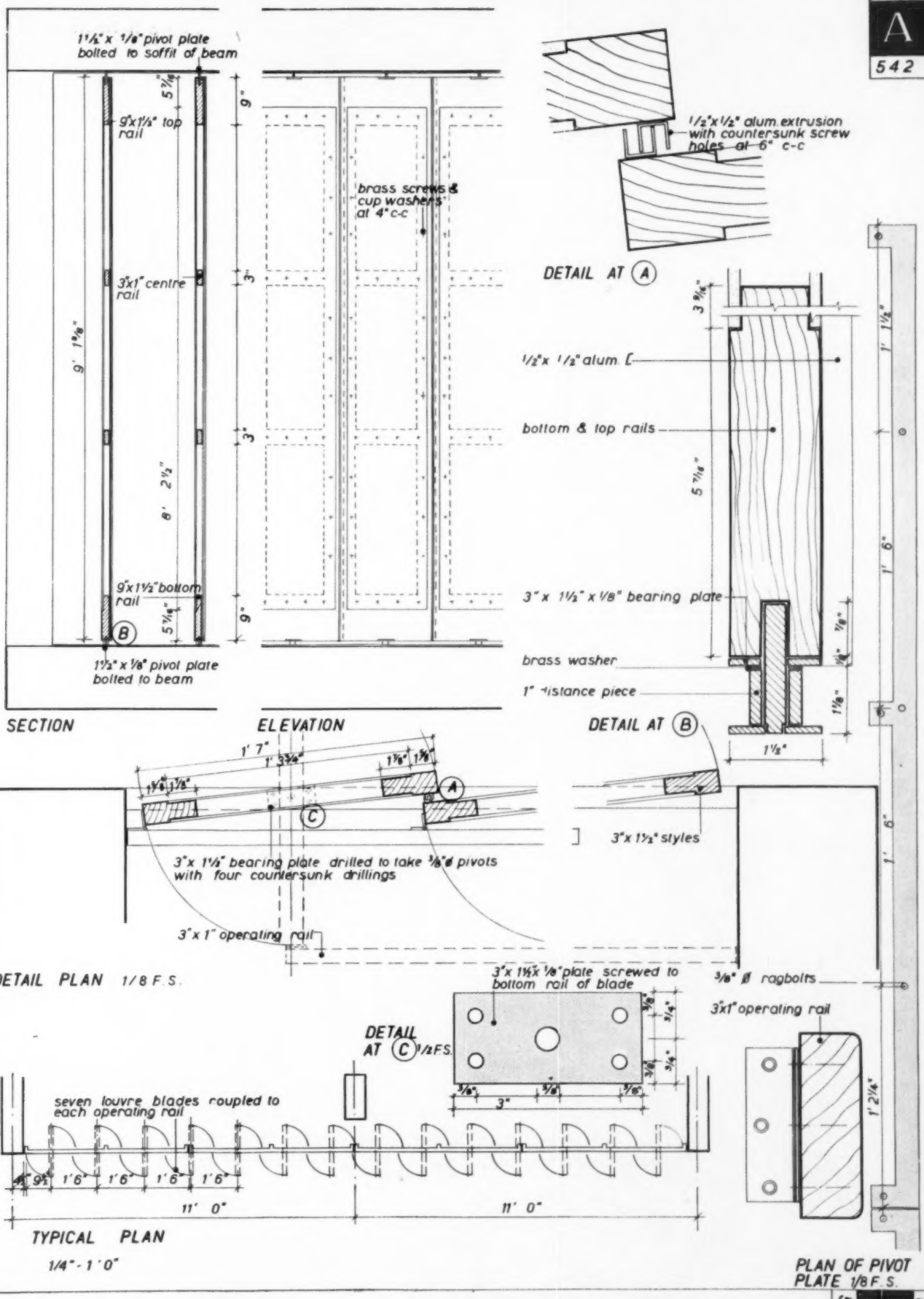
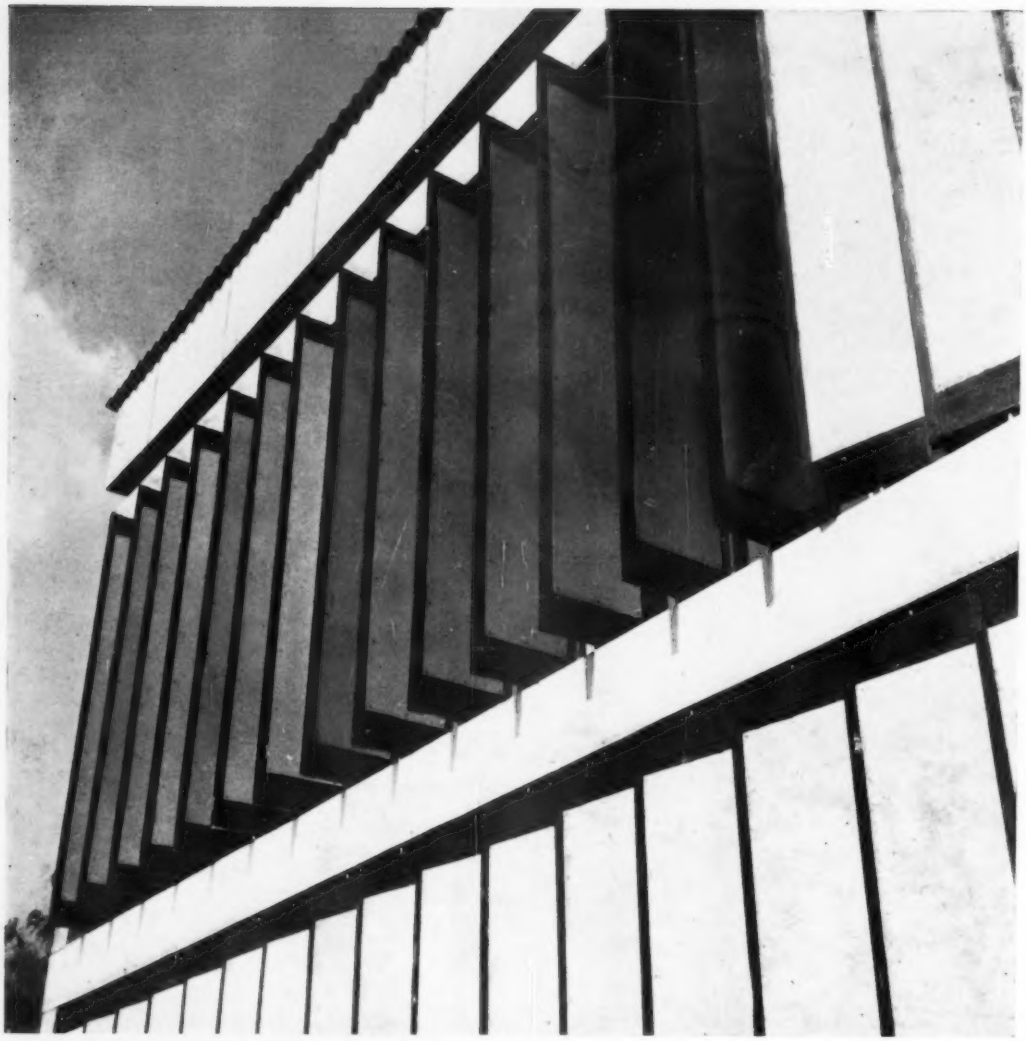


SUN BREAKERS. OFFICES. IBADAN. NIGERIA. ARCHITECTS' CO-PARTNERSHIP



These vertically pivoted shutters in the Marketing and Exports offices in Ibadan, Nigeria, are coupled in groups of seven to each operating rail. The framework of the shutters is painted black with glazed asbestos externally, and plywood painted gloss white internally. The architects are Architects' Co-Partnership

SUN BREAKERS,
OFFICES, IBADAN, NIGERIA

CONTRACT • NEWS •

Notes below give basic data of contracts open under locality and authority which are in a bold type. References indicate : (a) type of work (b) address for application. Where no town is stated in the address it is the same as the locality given in the heading (c) deposit (d) last date of application (e) last date and time for submission of tenders. Full details of contracts marked • are given in the advertisement section.

OPEN

BUILDING

BELFAST. (a) New classrooms, special subjects block, assembly hall, major extensions and alterations at St. Malachy's College, Antrim Road. (b) J. A. Tynan, quantity surveyor, 33 Malone Road, Belfast. (c) 10gn. (e) August 31.

* * *

BIRKENHEAD B.C. (a) One block of four bungalows for aged persons. (b) Borough Architect, 3 Conway Street. (c) 2gn. (e) September 1.

* * *

BRIERLEY HILL B.C. (a) Mullett Street Housing Scheme "D". (b) Architect and Housing Director, Civic Buildings. (c) 2gn. Fixed price basis.

* * *

COWES U.C. (a) Erection of a convenience at Queen's Road and a shelter and public convenience at the Pavilion Hotel site, The Parade. (b) Engineer and Surveyor, Northwood House, Cowes, Lo.W. (c) 2gn. (e) September 4.

* * *

DEVON C.C. (a) Erection of police section stations and quarters at South Brent and Yelverton. (b) County Architect, 97 Heavitree Road, Exeter. (c) 2gn each contract. Cheque payable "Devon C.C."

* * *

DONCASTER B.C. (a) Erection and completion of a Museum and Art Gallery at Chequer Road, including a two-storey administration block and single-storey lecture theatre, and site works. (b) Borough Architect, 15 South Parade. (c) 3gn. (e) September 17.

* * *

DULVERTON R.C. (a) Eight "Unity" type bungalows with works incidental, at Jury Road. (b) Public Health Inspector and Surveyor, the Offices, High Street, Dulverton, Somerset. (c) 3gn. (e) September 1.

* * *

DUNHERED B.C. (LAUNCESTON). (a) Cattle Market improvements, fat cattle section. (b) Town Clerk, Municipal Offices, Western Road, Launceston. (c) 3gn. (e) August 28.

* * *

EAST RIDING OF YORKSHIRE C.C. (a) Erection of classrooms and cloakrooms at Hedon County Primary School, near Hull. (b) County Architect, County Hall, Beverley. (c) £2. (e) September 1.

* * *

EIRE—CORK C.C. (NORTH CORK DISTRICT). (a) Provision of a water supply to Clondulane village for Cork County Council. (b) Tender documents from Secretary, Cork County Council, Annabella, Mallow, on payment of £1 per set (not returnable). (c) 10gn (each tender). (e) September 4.

* * *

EIRE—GRANGEGORMAN M.H.B. (a) Turf-fired boiler house installation and turf-handling equipment to be provided at St. Ita's Hospital, Portrane, Co. Dublin, for Grangegorman Mental Hospital Board. (b) Messrs. J. A. Kenny &

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Partners, 44 Kildare Street, Dublin. (c) 10gn. (e) September 3.

• • •

EIRE—KILDARE C.C. (a) The carrying out of Regional Water Supply Scheme 2/3, Contract No. 5, for Kildare County Council. (b) Nicholas O'Dwyer & Son, Constructing Engineers, 6 Burlington Road, Dublin. (c) 10gn. (e) September 15.

• • •

EIRE—KINSALE. (a) Erection and completion of a factory at Barrack Green, Kinsale, Co. Cork, for Messrs. H. Graepel Ltd. (b) E. P. O'Flynn, Trinity Chambers, 60 South Mall, Cork. (c) £20. (e) August 18.

• • •

EIRE—MITCHELSTOWN C.B.S. (a) Erection and completion of an extension and alterations to Christian Brothers' Schools, Mitchelstown, Co. Cork. (b) E. P. O'Flynn, Trinity Chambers, 60 South Mall, Cork. (c) £20. (e) August 26.

• • •

EIRE—RATHEA P.C. (a) Renovations and alterations of the Parish Church at Rathea, Co. Kerry, for Very Rev. A. J. Molyneux, P.P. (b) J. R. Boyd Barrett, C.A., 5 Camden Place, Cork. (c) 5gn. (d) August 14. (e) August 21.

• • •

GREAT YARMOUTH B.C. (1) (a) Erection of one block of three maisonnettes and three flats at Queen's Road. (2) Demolition of part of existing superstructure and erection of shops, covered tier seating, entrance and toilets at the swimming pool, Marine Parade. (b) Borough Engineer and Surveyor, Town Hall. (c) 2gn. (e) September 4.

• • •

HUCKNALL U.C. (a) Welbeck housing estate. Erection of 150 houses and flats. (b) Engineer and Surveyor, Council Offices, Watnall Road, Hucknall, Notts. (c) 2gn. (e) August 31.

• • •

LITHERLAND U.C. (a) Construction of one block of buildings incorporating eight shops and seven flats, with five garages and ancillary works, on the Ford Estate. (b) G. D. Walford & Partners, 20 Castle Street, Liverpool, 2. (c) 3gn. (e) September 1.

• • •

MYNYDDISLWYN U.C. (a) Erection of 42 traditional houses at Upper Penllwyn Housing site at Pontllanfraith. (b) Engineer and Surveyor, Council Offices, Pontllanfraith, Blackwood, Mon. (c) 3gn. (e) September 17.

• • •

NEWBURN U.C. (a) Fixed price tenders. Erection of 30 houses, 20 on Kielder Road and 10 on Valley View, Lemington. (b) Surveyor, Council Offices, Newburn, Newcastle-on-Tyne, 5.

NORTHALLERTON B.C. (a) Eight old people's dwellings, in single storey traditional construction at Romanby. (b) Clerk of the Council, The Old Vicarage, Northallerton, Yorks. (c) 2gn. (e) September 2.

• • •

RICHMOND (SURREY) B.C. (a) Conversion of Ham Farm buildings, Ham, into a tea room and sports changing accommodation. (b) Borough Engineer, Hotham House, Heron Court, Richmond. (c) 2gn. (e) September 7.

• • •

ROYTON U.C. (a) Birchin Lee housing site. Erection of 62 flats, 16 houses, four shops and four maisonnettes. (b) Messrs. Heywood & Ogden, 12 Clegg Street, Oldham, Lancs. (c) 2gn. (e) September 1.

• • •

STONE R.C. (a) Redevelopment of Eccleshall clearance area contract No. 1. Erection of 12 brick houses with seven garages and incidental site works off Stone Road, Eccleshall. (b) Hollins, Jones & Oldaker, Lloyds Bank Chambers, Newcastle, Staffs. (c) £2.

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STOURBRIDGE B.C. (a) Wollaston Farm estate. Erection of 28 brick built garages, construction of hard standing and incidental works. (b) Borough Engineer and Surveyor, Council House. (c) 2gn. (e) September 9.

• • •

ULSTER, BANBRIDGE U.D.C. (a) Housing Scheme No. 5. Erection of 52 houses together with ancillary and engineering works at Banbridge, for Banbridge Urban District Council. (b) Messrs. Nial P. Heron & Partners, Architects and Engineers, Bridge Street, Banbridge. (c) 5gn. (e) September 7.

• • •

WILMSLOW U.C. (a) Lacey Green estate. (1) Roads and sewers. (2) Erection of 52 one-bedroom flats in blocks of four and 74 three-bedroom houses. (b) Clerk of the Council, Council Offices, Green Hall, Wilmslow. (d) immediately.

• • •

WORCESTER C.C. (a) Exterior redecoration and repair of Hillborough, Tallow Hill, in two separate contracts. Part 1, Nurses Home, Ankerdins Block and adjoining lavatory block. Part 2, Superintendent's house, dining hall block at Shelsey, Lickey, reception and assistant matron's house. (b) City Engineer and Surveyor, 22 Bridge Street, Worcester. (c) 2gn each contract. (e) August 25.

PLACED

Notes on contracts placed state locality and authority in bold type with (1) type of work (2) site, (3) name of contractor and address, (4) amount of tender or estimate. † denotes that work may not start pending final acceptance, or obtaining of licence, or modification of tenders, etc.

ABERDEEN T.C. (1) Erection of 155 houses. (2) Kincorth estate. (3) A. Hall & Son Ltd., Northfield, Aberdeen. (4) £254,560.

• • •

BRISTOL C.C. (1) Reconstruction and additions to the Guildhall. (3) Wilkins & Corentry Ltd., Cumberland Road, Bristol. (4) £135,239.

• • •

CAMBRIDGE. (1) Additions to Queens College, for the Governors. (3) W. Sindall Ltd., Cherryhinton Road, Cambridge.

• • •

CARDIFF C.C. (1) Multi-storey car park. (2) Wood Street. (3) Building & Construction Co. Ltd., Stone House, Bishopsgate, London, E.C.2. (4) £158,539.

• • •

CHELMSFORD. (1) Extensions. (2) Essex House School for Boys. (3) H. Potter (W. Sharp) Ltd., Fairfield Works, Chelmsford.


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CHELTENHAM B.C. (1) 38 dwellings. (2) Mand's Elm site. (3) George Wimpey & Co. Ltd., Hammersmith, W.6. (4) £57,362.

• • •

CUMBERLAND C.C. (1) Erection of boys' secondary school. (2) Penrith. (3) R. E. Reay & Son (Penrith) Ltd., Great Dockray, Penrith.

• • •

DARLINGTON B.C. (1) Erection of a crematorium. (2) West Cemetery. (3) W. Sanders Hutton Ltd., 43 Coniseliffe Road, Darlington. (4) £36,000.

• • •

EDINBURGH C.C. (1) Reinstatement of the Town Hall. (2) W. Arnott McLeod & Co. Ltd., Edinburgh. (4) £119,683.

• • •

GT. YARMOUTH B.C. (1) Erection of Hostels for the aged, blind and infirm. (2) Magdalens College estate. (3) H. A. Holmes & Sons Ltd., South Ice House Hill, Gorleston, Gt. Yarmouth. (4) £69,068.

• • •

GREENOCK B.C. (1) First section redevelopment of Central Station area. (3) Blackburn (Dumbarton) Ltd., Castle Road, Dumbarton. (4) £171,500.

• • •

HENDON B.C. (1) Extensions to the Town Hall. (3) Howard Farrow Ltd., Russell Parade, Golders Green, London, N.W.11. (4) £57,625.

• • •

LIVERPOOL. (1) Superstructure of new buildings for Alliance Assurance Co. (2) Frontage on Tithebarn Street. (3) John Williams (Liverpool) Ltd., 70 Collungwood Street, Liverpool.

• • •

LONDON, E.C. (1) Erection of a section house for Metropolitan Police. (2) Golden Lane, E.C.1. (3) H. Neal Ltd., 117 Baker Street, London, W.1. (4) £180,810.

• • •

NEWCASTLE-ON-TYNE C.C. (1) 27 flats in three storeys. (2) Scotswood Road. (3) W. D. & R. Allison & Sons, Whitburn, near Sunderland. (4) £51,372.

• • •

NORWICH C.C. (1) Construction of a service reservoir. (2) Mousehold. (3) Leaven Ltd., Wetherby Road, Leeds, 8. (4) £52,806.

• • •

READING B.C. (1) Branch library. (2) Tilehurst. (3) Clayton Heath Ltd., Maidenhead. (4) £20,017.

• • •

REDDITCH B.C. (1) Erection of a College of Further Education. (3) Coleman & Tyas Ltd., Bidford-on-Avon. (4) £185,374.

• • •

RIVER TEES CONSERVANCY COMMISSION. (1) Construction of five deep water berths. (2) Lackenby. (3) The Demolition & Construction Co. Ltd., (3) St. James's Square, London, S.W.1. (4) £1,389,854.

• • •

ST. MARYLEBONE B.C. (1) 67 flats. 60 in a 16 storey block, 10 shops. (2) Church Street extension. (3) Gee, Walker & Slater Ltd., 100 Park Lane, London, W.1. (4) £254,358.

• • •

ST. PANCRAS B.C. (1) 180 dwellings. (2) Regents Park (Area C) housing scheme. (3) Direct Labour. (4) £534,400.

• • •

SHEFFIELD C.C. (1) Erection of four multi-storey flats (208 dwellings). (2) Brookhill Section, Netherthorpe area. (3) Public Works Department, Sheffield Corporation (recommended). (4) £512,000.

• • •

THORNABY-ON-TEES B.C. (1) 79 dwellings and 19 garages. (2) Humphreys estate. (3) Robert B. Bainbridge Ltd., High Street Stockton-on-Tees. (4) £111,321.

• • •

TOTTENHAM B.C. (1) 42 dwellings. (2) Tewkesbury estate. (3) Direct labour. (4) £94,213.

• • •

TWICKENHAM B.C. (1) 56 dwellings. (2) Chertsey Road. (3) Anglo-Scottish Construction Co. Ltd., 112a Coombe Lane, London, S.W.20. (4) £77,298.

• • •

WORCESTER C.C. (1) Erection of Prince Henry's Grammar School. (3) W. A. Cox Ltd., Abbey Gate, Worcester. (4) £91,279.

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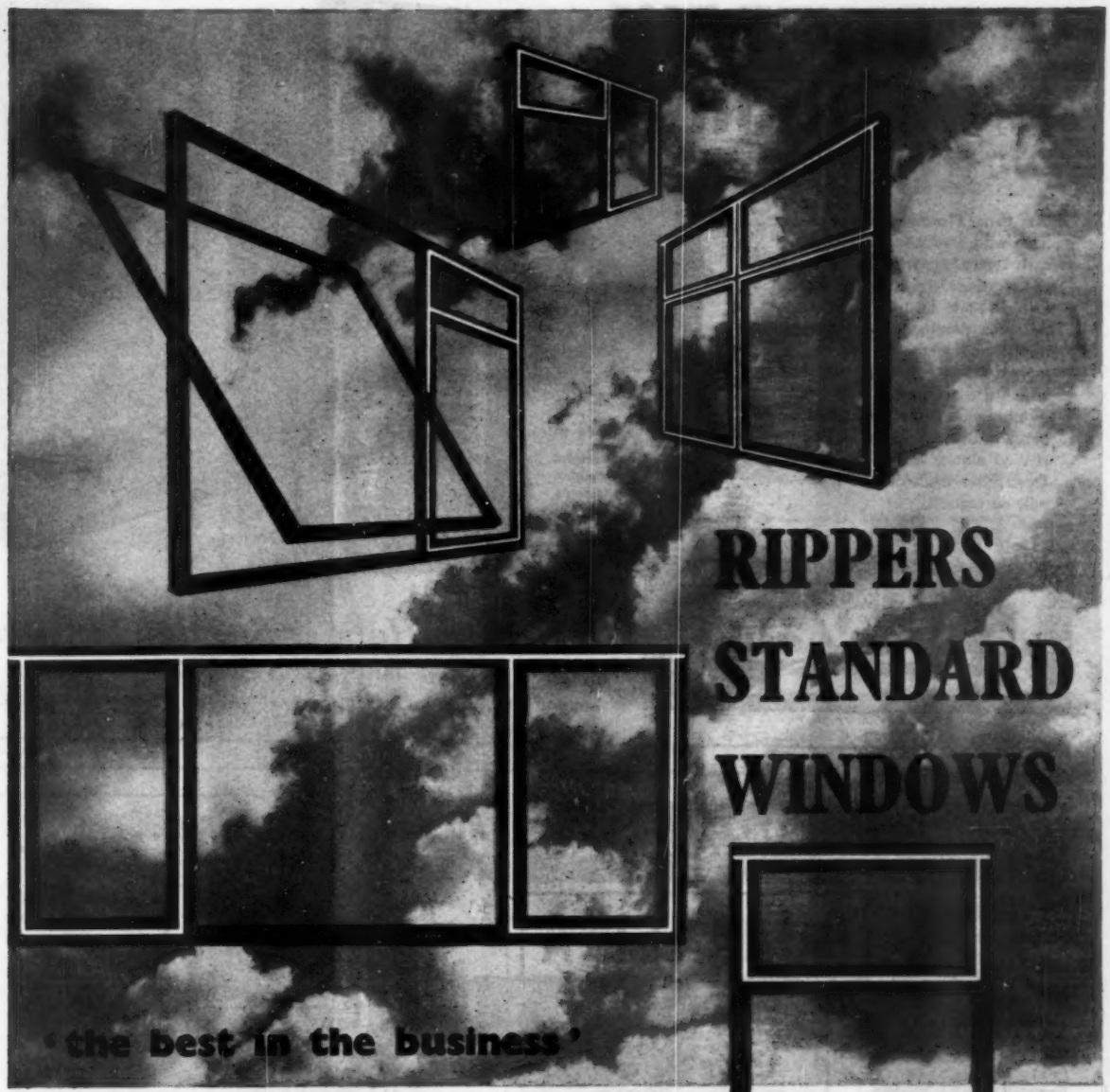

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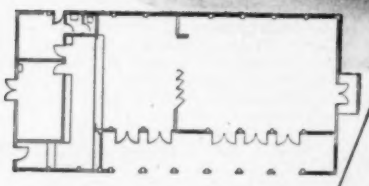

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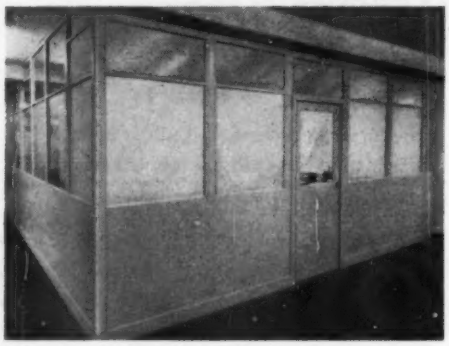

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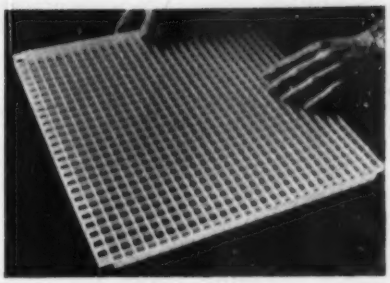

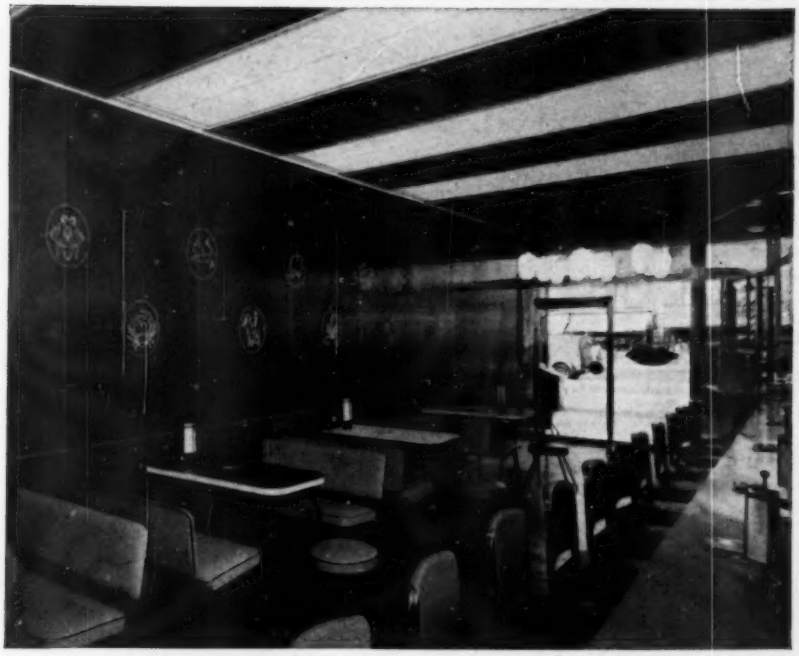

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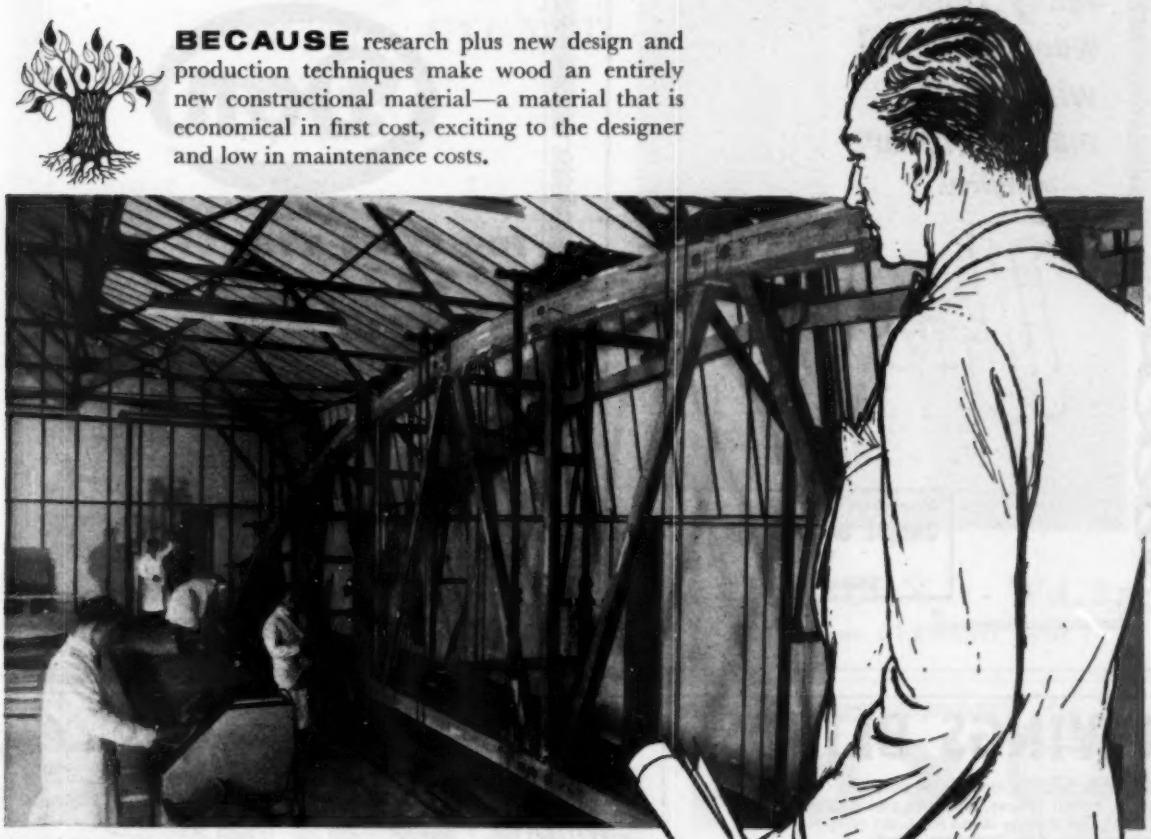

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APPOINTMENTS

Borough of Crosby
CAPITAL WORKS PROGRAMME

APPLICATIONS are invited for the appointment of a Principal Architectural Assistant at a salary in accordance with APT IV of the Conditions of Service (£1,065/£1,220).

The successful applicant will be required to take charge under the Chief Assistant of Architectural Works other than housing and in particular the construction of the new swimming bath.

It is the Council's policy to assist in the provision of housing accommodation on satisfactory proof of need.

Applications on forms obtainable from the Borough Engineer at the address below must be received, suitably endorsed not later than Monday, August 31, 1959.

Canvassing directly or indirectly will disqualify.

HAROLD O. ROBERTS,
Town Clerk.

Town Hall,
Waterloo,
Liverpool, 22. [5458

Hampshire County Council

ASSISTANT ARCHITECT (Special Scale £785/£1,070) required in the County Architect's Department. Candidates must have passed Parts I and II of the R.I.B.A. Final Examination, or equivalent, and have had at least five years' experience (including the period spent in theoretical training). The commencing salary will be determined by experience and ability. The post is pensionable and subject to a satisfactory medical report. Assistance given with removal and other expenses in approved cases.

Application forms (sent s.a.e.) returnable by August 26 from the Clerk of the County Council, The Castle, Winchester. [5455

Government of Tanganyika

EDUCATION OFFICERS (Technical Training), preferably between 25 and 40, required to teach (a) Civil Engineering and allied subjects, (b) Building Construction and Drawing and elementary Quantity Surveying and allied subjects. Qualifications for (a) Degree in Engineering or A.M.I.C.E., (b) Corporate Membership of (1) Royal Institute of British Architects or (2) Incorporated Association of Architects and Surveyors or (3) Associate of Institute of Builders. Either a teacher's certificate or minimum of two years' teaching experience essential for both posts. Posts on contract/resettlement grant terms. Home pension rights can be preserved. Salary at appropriate points in scales £879/£1,617 or £939/£1,863 inclusive. Quarters at low rental. Free passages and medical attendance. Outfit and education allowances. Tour of service 30-36 months. Low income tax. Generous home leave. Further particulars and application forms from the Director of Recruitment, Colonial Office, London, S.W.1, quoting BCD 114/8/05(b). [5341

Sheffield Regional Hospital Board

APPLICATIONS are invited for the following posts in the Architectural Division of the Board's headquarters staff:

Senior Assistant Quantity Surveyor. Candidates must hold Corporate Membership of the Royal Institution of Chartered Surveyors. Commencing salary £1,050 x £30(3) x £35(3)—£1,245 per annum.

Two Assistant Architects. Candidates must be Registered Architects and have passed the requisite examinations. Salary according to age and experience within the scale £730/£1,055 per annum.

Appointment is subject to the Whitley Council terms and conditions of service, to the National Health Service (Superannuation) Regulations, and to one month's notice on either side. Applications, together with the names of three referees, should be sent to the Secretary to the Board, Fulwood House, Old Fulwood Road, Sheffield, 10, not later than September 11, 1959. [5497

Government of Gambia
ARCHITECT
Public Works Department

TO take charge of the Architectural Branch and to carry out the planning and design of all Government Architecture under the general supervision of the Director of Public Works. Contract appointment. Salary range £1,086 to £1,680. Gratuity (25 per cent of emoluments). Free passages. Rented quarters. Candidates aged 35-45 must be A.R.I.B.A. with at least ten years post qualification experience. Not required to take up duties before next March. Write Director of Recruitment, Colonial Office, London, S.W.1, giving full names, age, qualifications and experience, quoting BCD.112/12/01/E1. [5471

APPOINTMENTS (cont)

London County Council
ARCHITECTS
Grade III

(UP to £1,135 commencing, according to qualifications and experience) for housing, schools and general divisions. Full varied programme of new work includes schools, multi-storey flats and town development. Particulars and application form from Hubert Bennett, F.R.I.B.A., Architect to Council, AR/EK/57/59), County Hall, S.E.1. (1132). [0204

Midlands Electricity Board
SECOND ASSISTANT ENGINEER

REQUIRED at the South Staffs and North Worcs Sub-area headquarters.

Duties will include site surveys, building planning and design and the preparation of drawings, quantities and specifications for a wide variety of buildings, including offices, stores, workshops, substations and showrooms. Experience in supervising building works would be of value. Possession of an appropriate qualification will be an advantage.

Salary £1,270/£1,360 per annum (N.J.B. Grade L.7). Superannuable.

Apply, by letter, within 14 days, stating age, experience, present position and salary to Mr. H. A. P. Caddell (Ref. CW), Sub-area Manager, Midlands Electricity Board, P.O. Box 9, Toll End Road, Tipton, Staffs.

A. STEPHENS,
Secretary.

[5491

Bracknell Development Corporation

APPLICATIONS are invited for the post of Assistant Architect, salary range £1,065/£1,220. Applicants must be Corporate Members of the R.I.B.A. Superannuation schemes, medical examination. Housing available. Apply by September 2, 1959, giving age, education and qualifications, experience and appointments held (with dates and salaries), and names of two referees, to General Manager (A), Bracknell Development Corporation, Farley Hall, Bracknell, Berks. [5480

County Borough of Great Yarmouth
Schools Architect's Department
APPOINTMENT OF JUNIOR ASSISTANT ARCHITECT

APPLICATIONS are invited to fill the vacancy for a Junior Assistant within APT Grade II (£765/£880).

Candidates should have had experience in school construction.

Applications, stating age, qualifications, experience, details of past and present appointments together with the names of two referees should reach the Schools Architect, 22 Euston Road, Great Yarmouth, by September 1.

D. G. FARROW,
Chief Education Officer.

22 Euston Road,
Great Yarmouth. [5487

Hamoshire County Council
JUNIOR ARCHITECTURAL ASSISTANT
APT-I (£610/£765)

REQUIRED in the County Architect's Department. Candidates should be studying for the Intermediate Examination of the R.I.B.A., and have had several years experience in an architects office. The post is pensionable and subject to a satisfactory medical report. Assistance given with removal and other expenses in approved cases. Five-day week.

Application forms (send s.a.e.), returnable by September 1, from the Clerk of the County Council, The Castle, Winchester. [5482

Borough of Royal Tunbridge Wells
ARCHITECTURAL ASSISTANT
(APT II £765/£880)

APPLICATIONS are invited for the post of in the Borough Surveyor and Waterworks Engineer's Department.

Candidates for the appointment should have had training and experience preferably in a Municipal Architect's office and have passed the Intermedidte Examination of the R.I.B.A. or a recognized equivalent.

The post will be superannuated and will be subjected to the National Scheme of Conditions of Service and the successful applicant will be required to undergo a medical examination.

Housing accommodation will be offered if required.

Applications, giving details of experience and qualifications, together with the names and addresses of two referees must be submitted to the Borough Surveyor and Waterworks Engineer not later than noon on September 7, 1959.

M. J. H. GIRLING,
Town Clerk.

Town Hall,
Tunbridge Wells. [5476

APPOINTMENTS (cont)

Surrey County Council
Kingston School of Art
Knights Park, Kingston upon Thames

APPLICATIONS are invited for the post of part-time Lecturer in the Department of Architecture, to commence with the new session 1959/60.

The person appointed will be required to instruct in the basic principles of general design and to assist with the supervision of the general architectural studies of the pre-Intermediate students.

Applicants must be qualified professionally, have had varied practical experience and be actively engaged in their profession. Previous teaching experience will be an additional advantage.

The vacancy is for three full days per week. The salary is in accordance with the Surrey Education Committee's rates of pay.

Applications should be forwarded to the Registrar, Kingston School of Art. [5478

Caterham and Warlingham Urban District Council
Engineer and Surveyor's Department

TECHNICAL ASSISTANT required on the Special Grade (£785/£1,070). Commencing salary according to qualifications and experience.

Preference will be given to applicants who are Corporate Members of the Institution of Civil Engineers or Institution of Municipal Engineers or who hold an equivalent architectural qualification. They must have had experience of Municipal Engineering, including Housing Development, Sewerage and road construction.

Applicants stating age, training, qualifications, present appointment and experience, together with the names of two referees, should be sent to the undersigned not later than September 4, 1959.

B. J. SMERDON,
Clerk of the Council.

Council Offices,
Caterham. [5488

City of Sheffield
City Architect's Department

FOLLOWING a revision of the establishment of the Education and General Section, applications are invited for the undermentioned vacancies on the permanent staff of the City Architect, Mr. J. L. Womersley, F.R.I.B.A., Dist.T.P., M.T.P.I., for work on an expanding and interesting programme comprising large and important civic buildings included in the rebuilding of large areas in the city centre: colleges, schools, libraries, art gallery, old people's and children's homes, bus garages, fire and police stations, health centres and clinics.

(a) **Group Leader Architects,** Grade APT V (Education and General) (£1,220/£1,375).

(b) **Senior Assistant Architects,** Grade APT IV (Education and General) £1,065/£1,220).

(c) **Assistant Architects,** Grade S.C. (£785/£1,070).

Commencing salaries within the above grades according to qualifications and experience.

Applications, stating post applied for, age, education and training, qualifications, present and past appointments (with dates and salaries), experience and the names of two persons to whom reference may be made, should reach me not later than Thursday, September 3, 1959.

JOHN HEYS,
Town Clerk.

August 13, 1959. [5490

Borough of Bedford
APPOINTMENT OF ASSISTANT ARCHITECT

APPLICATIONS are invited for the above position in the Architectural Section of the Borough Engineer and Surveyor's Department.

Applicants must be A.R.I.B.A. and the salary will be in accordance with the Special Grade for qualified Architects £785/£1,070 p.a. commencing at a point commensurate with experience and qualifications.

Bedford is a rapidly expanding Borough and the Department is at present concerned with a large housing programme, design and construction of new municipal offices, multi-storey flats, etc.

The Council is prepared to assist in the provision of housing and contribute towards the cost of removal expenses.

The appointment is permanent, superannuable and subject to one month's notice on either side, and the successful applicant will have to pass a medical examination.

Forms of application and particulars of the appointment may be obtained from the undersigned and should be returned not later than September 7, 1959.

F. W. DAWKES,
B.Sc.(Eng.), A.M.I.C.E., M.I.Mun.E., A.M.T.P.I.
Borough Engineer and Surveyor.

Newnham House,
Horne Lane,
Bedford. [5481

APPOINTMENTS (cont)

Beeston and Stapleford Urban District Council
SENIOR ARCHITECTURAL ASSISTANT

APPLICATIONS are invited for the above appointment at a salary according to experience in Special Grade (£785/£1,070).

Housing accommodation will be provided if necessary. Candidates must be A.R.I.B.A., with preferably some experience of Municipal Housing.

Applications, stating age, qualifications, with details of training and experience, accompanied by the names of two referees must be received by the Housing Architect, Town Hall, Beeston, Nottingham, not later than September 11, 1959.

H. D. JEFFRIES,
Clerk of the Council.

Town Hall,
Beeston,
Nottingham. [5493

Midlands Electricity Board
SECOND ASSISTANT ENGINEER (BUILDING)

REQUIRED at the South Staffs and North Worcs Sub-area headquarters.

Duties will include supervising the erection, alteration and maintenance of a wide variety of buildings, including offices, stores, workshops, substations, showrooms and other building works. Applicants should have had experience of the control and supervision of building operatives, and possession of appropriate qualifications will be an advantage. Experience in the preparation of plans and specifications would be of value.

Salary £1,270/£1,360 per annum (N.J.B. Grade L.7). Superannuable.

Apply, by letter, within 14 days, stating age, experience, present position and salary to Mr. H. A. P. Caddell, (Ref. CW), Sub-area Manager, Midlands Electricity Board, P.O. Box 9, Toll End Road, Tipton, Staffs.

A. STEPHENS,
Secretary.
[5492

APPOINTMENTS (cont)

County Borough of Blackpool

APPLICATIONS (to be received by September 9) are invited for the following posts in the Borough Surveyor's Department:

(a) **Chief Assistant Quantity Surveyor,** APT V (£1,220/£1,375).

(b) **Principal Assistant Architects,** APT IV (£1,065/£1,220).

(c) **Assistant Architects,** APT Special (£785/£1,070).

(d) **Architectural Assistants,** APT I (£610/£765) or II (£765/£880).

(e) **Quantity Surveying Assistant,** APT II (£765/£880).

(f) **Draughtsman,** Miscellaneous III (£525/£590).

Application forms and particulars from Arthur Hamilton, B.Sc., A.R.I.B.A. (Borough Surveyor), P.O. Box 17, Municipal Buildings, Blackpool. [5483

Borough of Harrow
PLANNING ASSISTANT

APPLICATIONS are invited for the appointment of a Planning Assistant in the Department of the Borough Engineer and Surveyor within APT Grade I (£610/£765) plus London Weighting.

The appointment will be subject to the Local Government Superannuation Acts and the National Joint Council's Scheme of Conditions of Service. Housing accommodation is not offered. Contributions towards removal expenses will be considered.

Application forms, obtainable from me, must be returned not later than August 31, 1959.

D. H. PRITCHARD,
Town Clerk.

Town Clerk's Office,
Harrow Weald Lodge,
92 Uxbridge Road,
Harrow Weald,
Harrow. [5451

TENDERS

County Borough of Brighton

FIXED price tenders are invited for erection of a five class Primary school at Westdene, Brighton.

Bills of Quantities and Form of Tender may be obtained from the Borough Surveyor, Engineer and Planning Officer, 26/30 Kings Road, Brighton, on or after Monday, August 24, 1959, on receipt of a returnable deposit of £2 2s.

Drawings may be inspected upon application at the Borough Surveyor's office. Tenders are to be delivered to the Town Clerk in the envelope provided, not bearing any name or mark indicating the sender, by noon on Tuesday, September 15, 1959.

W. O. DODD,
Town Clerk.
[5480

Mablethorpe and Sutton Urban District Council
Trusthorpe Housing Scheme

TENDERS are invited for the erection of 32 flats and flatlets in three two-storey blocks, namely two blocks each consisting of eight single-person flats and one block of 16 single-person flatlets with warden's quarters and community centre, together with ancillary services.

Plans may be inspected and Bills of Quantities may be obtained from the Council Offices, Mablethorpe, on payment of a deposit of £3 3s, which will be returned on receipt of a bona fide tender.

Sealed tenders, in plain envelopes, endorsed "Trusthorpe Housing," must be received by the undersigned not later than noon on September 8, 1959.

The Council does not bind itself to accept the lowest of any tender received.

R. VINCENT LEWIS,
Clerk of the Council.

Council Offices,
Mablethorpe. [5495

MISCELLANEOUS SECTION

RATE: 1/9d per line, minimum 3/6d, average line 6 words. Each para charged separately. Advertisements for Situations Wanted are accepted at the specially reduced rate of 6d. per line, minimum 1/6d.

BOX NOS. add 2 words plus 1/- for registration and forwarding replies which should be addressed c/o "The Architect & Building News," Dorset House, Stamford Street, London, S.E.1.

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PRESS DAY, Monday. Remittances payable to Messrs. Iliffe & Sons Ltd., Dorset House, Stamford Street, London, S.E.1.

No responsibility accepted for errors

ARCHITECTURAL APPOINTMENTS VACANT

ARCHITECTURAL ASSISTANT, London, Final standard. Industrial and commercial. Progressive and interesting. Salary according to experience and ability. Box 3667. [0079

ARCHITECTURAL ASSISTANT required to manage smaller contracts in busy country practice. Must be car driver. Write G. C. Beech & Partners, Deanery Offices, Wells, Somerset. [5465

ASSISTANT ARCHITECT required having experience in industrial buildings and projects. Must be capable of administration and control of contracts. A.R.I.B.A. essential. Apply stating age, experience and salary required to Group Architect, The British Thomson-Houston Co. Ltd., Rugby. [5445

ARCHITECTURAL ASSISTANT. Intermediate standard. Busy London office. Good prospects. Box 3668. [0080

ARCHITECTS' DEPARTMENT of Schweppes Ltd. needs Assistants. Applicants must have a sound knowledge of building construction and an aptitude for organization and administration. Salary by arrangement. Please write, stating age, etc., to the Personnel Manager, Schweppes House, Connaught Place, London, W.2. [5441

ARCHITECTS AND SURVEYORS with general practice require Assistants (Intermediate, Qualified or equivalent standards), with initiative and ability to work with minimum supervision Excellent opportunity for acquiring wide experience on small and large scientific, commercial and industrial buildings. Good salary. Luncheon vouchers. Pension scheme. Five-day week. Ley, Colbeck & Partners, F/F.R.I.B.A., F/F.R.I.C.S., 51 Bishopsgate, London, E.C.2, LONdon Wall 7282. [0207

COVELL & MATTHEWS require Architectural Assistants for work on central area projects. Salary range: £550-£850. Five-day week. Telephone REGent 2291 for appointment. [5473

GOLLINS, MELVIN, WARD & PARTNERS have vacancies for staff experienced and interested in supervision. Five-day week, quarterly bonuses, pension scheme. Ring Welbeck 9991 for appointment. [5425

ARCHITECTURAL APPOINTMENTS VACANT (cont)

GOLLINS, MELVIN, WARD & PARTNERS are looking for staff to work on the design of hospital, university and office projects. Age and experience are less important than enthusiasm and interest in architecture. Five-day week, quarterly bonuses, pension scheme. Ring Welbeck 9991 for appointment. [5424

BRITISH RAILWAYS. Applications are invited for the following positions in the office of the Architect, Eastern Region, King's Cross station. (1) **Assistant Architect.** Starting Salary £943 per annum. Applicants should be qualified architects with some years practical experience. (2) **Assistant Architect.** Starting salary £833 per annum. Applicants should be qualified or should have passed the Intermediate R.I.B.A. examination with some years practical experience. (3) **Architectural Assistant.** Starting salary according to qualifications and experience. The office is engaged on work of a varied and interesting character and a progressive approach to design and building techniques is essential. The successful applicants will be given responsibility for design, administration and site supervision appropriate to their ability. Five-day week and concessionary rail travel. Apply in writing stating post applied for and giving particulars of age, experience and qualifications to the Chief Civil Engineer, British Railways, Eastern Region, King's Cross Station, London, N.1. [5471

KEEN YOUNG ASSISTANT required, West End office. Must be good draughtsman and have sound knowledge of building construction. Salary £750/£850. Apply William Ryder, 21 Bruton Street, Berkeley Square, W.1. [5440

LESLIE GOODAY, A.R.I.B.A., F.S.I.A., requires Assistant of Intermediate standard. Apply in writing to 17 Sloane Street, London, S.W.1. [5494

QUALIFIED ARCHITECT required by leading commercial company with go-ahead ideas. The work is exciting, stimulating, and offers opportunities to a reasonably experienced man who has carried responsibility. Applications in writing, giving qualifications, age, experience, salary required to Box 4515. [5484

ARCHITECTURAL APPOINTMENTS VACANT (cont)

ROBERT POTTER and **RICHARD HARE,** F/A.R.I.B.A., have a vacancy for a recently qualified Assistant Architect to work on interesting University and Civic projects. Five-day week. Existing holiday arrangements will be honoured. Write giving details of qualifications, experience and salary required to De Vaux House, Salisbury. [5475

SEVERAL Senior and Intermediate Architectural Assistants are required for commercial projects including hotel, theatre and extensive development schemes of offices and light industry, etc., in London architect's office. Holiday arrangements will be recognized. Five-day week. Salary according to experience. Telephone City 8811. [0205

TECHNICAL REPRESENTATIVES with knowledge of the building industry required in London, Southern and Home Counties by Specifile Information Service. Salary, with commission, £1,100/£1,500 per annum. A knowledge of building problems and costs would be useful as would a good speciality selling record. Apply giving details of experience and background to: Specifile Ltd., 131 High Street, Croydon, Surrey. [5477

TWO Architectural Assistants. Intermediate standard, required for very large scheme. Considerable office experience is desirable. West End office. Excellent salary, bonus and luncheon vouchers. Box 3880. [0202

YORKE, ROSENBERG & MARDALL require Assistants. Apply in writing to 2 Hyde Park Place, London, W.2. [5479

YOUNG qualified Architect required with a view to immediate partnership in established Norfolk country practice. Capital not necessarily required. Reply with experience. Box 4531. [5496

Classified advertisements continued overleaf

SITUATIONS VACANT

ARCHITECT OR BUILDING SURVEYOR required by industrial group with headquarters in Lincolnshire. Sound all-round knowledge in the architectural field. Salary from £1,250 according to experience. Write Box 4416. [5449

SURVEYING ASSISTANT required, intermediate standard, good knowledge of building construction and experience of site surveys, theodolite and dumpy level. Applicants please state salary, experience and age. A. Hargreaves & Partners, Architects and Surveyors, 17 Crook Log, Bexleyheath, Kent. [5483

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G. BARTER & CO., Industrial Decorative Spray and Brush Painters (labour only on contract). We supply equipment, 1a Whitton Way, Hounslow, Middlesex. HOUnslow 9615, SOUthall 3815. [0083

INQUIRIES invited for manufacture of builders' engineering items—steel frames, trusses, steel doors, etc., particularly in specialist work. Keen prices and quick delivery. Burley's, Weybridge, Surrey. Byfleet 4111. [5485

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UNIVERSITY OF MANCHESTER
The next session commences on Tuesday, October 13, 1959. [5472

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Issue dated 19 August 1959

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New Products when published in the editorial columns are alphabetically listed. Please mark those letters where you would like to receive further information and catalogues. For information on other editorial content enter your inquiry in the space provided.

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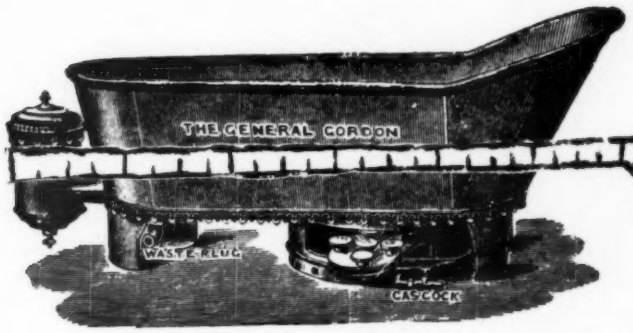

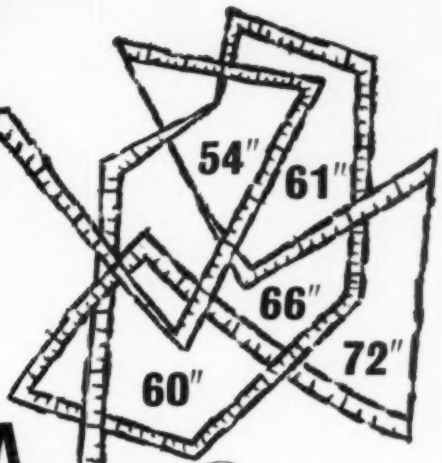

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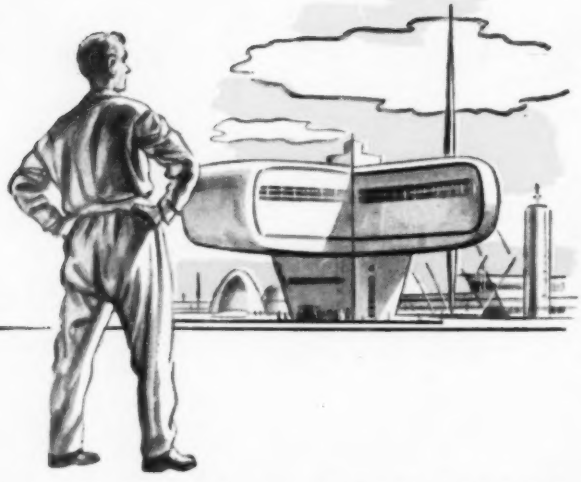

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